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THE OPHTHALMIC RECORD

///

A Monthly Review of the Progress
of Ophthalmology

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THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII

CHICAGO, JANUARY, 1908

NO. 1, NEW SERIES

Original Articles

INFECTION WITH MORAX-AXENFELD DIPLOBACILLUS. CLINICAL APPEARANCES, SOME CHARACTERIS- TICS AND TREATMENT, WITH REPORT OF SIX CASES.

FRANK C. TODD, M.D.

MINNEAPOLIS, MINN.

Attention was called to the fact that zinc preparations were specific in the treatment of the Morax-Axenfeld diplobacillus, by Dr. Brown Pusey, at the 1906 meeting of the American Medical Association. This has caused me to look carefully for these cases and to keep notes concerning their course and treatment. I, therefore, report the following cases in detail and follow by summing up what may be learned from this experience. I have been assisted in both the microscopic examinations and treatment in these cases by my associate, Dr. John S. Macnie.

Case 1. referred to me by Dr. C. A. Lester of Wabasha, brought a letter from Dr. Lester from which the following is taken: "Mr. I. came to me with iritis, small corneal ulcer left eye, severe conjunctivitis both eyes, given atropin, 1 per cent. solution, every four hours, argyrol, 20 per cent. solution, every three hours; after several days of above treatment he showed no improvement and was sent to hospital, where he was given hot applications for a few days, in addition to atropin and argyrol; then, after a few days, hot, wet dressings, changed every hour, and saturated boric acid solution collyrium, a pint at a time. Ulcer was touched with Tr. iodin every two days. Ulcer appeared on cornea of right eye. Atropin increased to 5 per cent. solution every two hours; still iris would not dilate. Was given saturated solution of potassium iodid up to 65 drops, t. i. d., and iodoform ointment, 10 gr. to oz., t. i. d. The disease continued to increase and the treatment seemed to be ineffective." This patient arrived the day of my return from the Boston meeting. His palpebral conjunctivæ were swollen so that there was some eversion of the lower lids. There was considerable muco-purulent secretion bathing the lids, the margins of which were macerated and thickened. The bulbar conjunctivæ were injected.

The cornea of the left eye showed three small active ulcers, one at upper margin, one in pupillary area and one at lower margin. The cornea of the right eye showed a progressing deep ulcer covering the lower inner quadrant. The aqueous humor was cloudy in both eyes. The irides of good color and pupils semidilated. Smears taken from caruncle showed Morax-Axenfeld diplobacillus in great numbers. Patient was sent to hospital and put to bed. Was given hot applications every three hours, followed by wiping everted conjunctivæ with a solution of sozoiodolate of zinc, 2 gr., and chlorotone, 1 gr., to water, 1 oz., and then argyrol, 20 per cent. ointment. Once a day atropin, 1 per cent. solution, was instilled and the ulcers touched with sozoiodolate of zinc, 10 gr. to the oz. Patient improved so rapidly after eighteen days he was allowed to go home, with instructions to continue use of zinc solution. In a week he returned, much worse: was put to bed and treatment resumed. It was found he could tolerate the sozoiodolate, 10 gr. to the oz. In two weeks the ulcers were healed, the conjunctiva thinner and whitened, and he was allowed to return home and instructed to use sozoiodolate of zinc, 10 gr. to oz., and ichthyol ointment, 10 per cent. Patient neglected treatment and suffered a partial recurrence, but consulted Dr. Lester, who put him on the zinc again, which was increased to 15 gr. to the oz. with toleration. Improvement resulted. Patient neglected treatment again, and has another small corneal ulcer, which, however, is yielding to proper treatment. Now, nine months after beginning of history, patient keeps well as long as he continues treatment with zinc, but relapses as soon as treatments are discontinued.

CASE 2.—Mrs. C., wife of physician. While at Lake Minnetonka eyes became inflamed, bulbar and palpebral conjunctivæ congested, but not swollen; eyes smarted and itched. There was much secretion during the day, but mornings eyelids were stuck together. Mrs. C.'s husband thought she had pink eye and, under advice, used silver nitrate solution, 2 per cent., argyrol solution and boric acid, with no benefit. She came to my office after about three weeks, and examination of smear revealed Morax-Axenfeld diplobacillus. She was given sozoiodolate of zinc, 2 gr. to the oz., to use every three hours, resulting in immediate relief. Treatment was discontinued soon, with return of symptoms, which again disappeared upon resuming the zinc in 3 gr. to the oz. solution. Treatment continued for three weeks after apparent cure and disappearance of bacteria, with permanent cure.

CASE 3.—Dr. C., husband of Case 2. One eye became inflamed, with smarting and itching: worse in the morning, when lids were

gummed together with secretion. Dr. C., who is a skilled bacteriologist, examined smear from his affected eye and discovered the Morax-Axenfeld diplobacillus. He immediately began the use of the zinc, 2 gr. to the oz., which caused some smarting, but held the conjunctivitis in check. He likewise suffered a relapse after discontinuing treatment and was obliged to use the zinc preparation for some time after the bacilli could not be found.

Both the above cases, Dr. and Mrs. C., trace their infection to a friend who had been visiting them shortly before Mrs. C. began to have trouble with her eyes. This friend had suffered for months from a chronic conjunctivitis, which resisted all ordinary medication for conjunctivitis (evidently a zinc preparation had not been used) and which seemed to correspond clinically with the conjunctivitis caused by the Morax-Axenfeld, though I did not see the case.

CASE 4.—Miss G., 17 years old, came to the office with all the objective indications of a subacute trachoma of two years' standing, i. e., swollen and injected lids, conjunctivæ velvety and presenting numerous granular areas. The bulbar conjunctiva was quite normal, but the corneæ showed extensive vascularization and roughening of the epithelium very similar to trachomatous pannus.

The lids were expressed and treated every day with silver, 2 per cent. solution, with slight improvement. Then, in addition, a 10 per cent. ichthyol ointment was applied, when the lids became less congested, the whitish appearance diminished and the pannus disappeared. Smears were taken when she first presented herself and no Morax-Axenfeld diplobacillus could be found, likewise again six weeks later, but a third smear later on revealed a few Morax-Axenfeld diplobacilli. Soziodolate of zinc, 6 gr. to the oz., was now added to the treatment, resulting in marked improvement. The patient went home in good condition and apparently cured, with instructions to her physician regarding treatment, but later presented herself at my office, stating that she had been under several physicians' care without relief, and at the time of her return I found a recurrence of the former trouble, with the presence of the Morax-Axenfeld diplobacillus. Improvement under ichthyol and soziodolate of zinc has been immediate and rapid and she is still under treatment.

CASE 5.—Mrs. H. For three weeks right eye has been inflamed, for two days left eye inflamed. Conjunctiva, bulbar and palpebral was injected, the lid margins looked swollen and soggy. There was not much secretion, but eyes teared easily and felt irritated. Smear

failed to show Morax-Axenfeld diplobacilli. Soziodolate of zinc in 6 gr. to oz. solution was used, because clinically the case resembled Morax-Axenfeld infection, with immediate relief and cure.

CASE 6.—Mr. R., farmer, aged 60, referred to Dr. Miller of Aberdeen, South Dakota. Never had trouble with eyes before, except an injury to the left lower lid at inner canthus, resulting in the lid sagging away from the eyeball, causing epiphora. Six weeks ago eyes began to get red, smarted and itched. The conjunctivæ are more inflamed at angles, the edges of the lids are thickened and the epithelium macerated. The left eye when the lower lid is everted shows considerable muco-purulent secretion. The right eye has little secretion. Smears from both eyes show myriads of the Morax-Axenfeld bacilli. Was returned to Dr. Miller, with advice to use the zinc solution, 6 gr. to the oz. Dr. Miller reported prompt improvement.

CASE 7.—Dr. T. came with history that he and all of his family were suffering from "pink eye," which nothing he could do would cure. Smears from the conjunctivæ showed Morax-Axenfeld bacilli and he was given soziodolate of zinc to use. No report.

CASE 8.—Miss W., referred by Dr. Slocumb of this city. Both eyes affected. Smear showed Morax-Axenfeld bacilli. Given zinc solution to use under Dr. Slocumb's direction. Dr. Slocumb reports that case improved rapidly, and smear taken two weeks after was negative. Patient left the city and did not receive any treatment for several weeks; then returned with condition much the same as when first seen. Treatment was resumed and last report indicates that case is apparently cured.

The facts brought out in the study of these cases are: First, clinical manifestations, (a) the infection at first seems acute, but later takes on a chronic form; (b) it may give rise to little or no secretion in some cases, while in others it causes profuse secretion; (c) irritation and itching are prominent symptoms in mild cases; (d) the cornea may become involved with purulent ulcers. Second, treatment: (a) the great tendency to relapse after the microscope fails to reveal the diplobacillus of Morax-Axenfeld shows the necessity for continuing the treatment for several weeks after apparent cure has taken place; (b) zinc preparations are specific, and the stronger the preparations used the more effective the result; (c) soziodolate of zinc can be used stronger than the other zinc preparations, patients being able to stand a 1 to 2 per cent. solution; (d) ichthyol ointment, 10 per cent., clinically is beneficial in treating these infections.

A CASE OF BELLADONNA POISONING.

W. EBERHARDT, M.D.

MICHIGAN CITY, IND.

September 16 a girl, 12 years of age, was brought to my office for refraction.

One of the well-known gelatine discs, containing 1.50 gr. of homatropin and the same amount of cocain, was placed in each eye. This produces, as a rule, full mydriasis within half an hour, but in this case only a slight dilatation ensued, so that I repeated the dose in each eye, without getting a more satisfactory result.

I then discharged the patient, advising her to come again next day. She did not return until the 18th, complaining of no bad results, except that she had not been able to see close by.

In order to get full dilatation of the pupil, I now resorted to a watery solution of atropin sulph., gr. 1.5ii, using four drops in each eye in the course of about an hour. Even this dose was not sufficient to dilate the pupil any more, so that I supplemented the treatment by placing in each eye another homatropin disc—with the same negative result. The paralysis of the accommodation, however, was complete, as shown by visual test.

The girl left the office at about 3 p. m. without showing any unusual symptoms. At about 5 p. m. her people called me up by telephone, saying she was "acting very queer" and "talking out of her head."

I proceeded at once to her residence, where I found the patient in full delirium and very restless. The pulse was 150, the skin dry and cool, lips and throat dry, breath offensive. The eyes were bright and staring, pupils rigid, *but only moderately dilated*.

According to her relatives, the girl began to show these symptoms soon after leaving the office.

I ordered cold applications to the head, and made an injection of 1.10 gr. of pilocarpin. Three hours later I found the patient in very much the same condition. I made another injection of pilocarpin and dissolved $1\frac{1}{4}$ gr. of morphin in ten spoonfuls of water, of which I gave her at once two (swallowing was difficult, but not impossible) and left order to give her another spoonful every half-hour until asleep.

In the afternoon of the next day the girl came to the office, perfectly restored. According to the story given by her relatives, the delirium had continued until 3 in the morning, when she finally fell asleep. On awakening, she was still laboring under a delusion, but after a hearty breakfast felt soon all right.

If we figure that 5ii of a watery solution contain about 120 drops, the patient had received about 1·15 of the whole solution; therefore, also 1·15 gr. of atropin and, in addition, 1·25 gr. of homatropin, so that in all she had received a little over 1·10 gr. of the active principle of belladonna, a good, but certainly not a very unusual amount, considering that it was not given at once and that part of it was washed out of the eyes by the tears.

The interesting feature of this case is the fact that a dose which was strong enough to bring about a severe systemic intoxication was not sufficient to produce full mydriasis. Indeed, the width of the iris was at all times greater than the radius of the pupil. The paralysis of the ciliary muscle, however, was complete, as T. 15 could not be read, while + 1.0 D. vision at fifteen feet was normal.

This is rather an uncommon phenomenon, as the sphincter yields more readily to atropin than the ciliary muscle. According to Taarsma,¹ a drop of a 1:80000 solution of atropin may already produce mydriasis, while it needs at least a 1:1200 solution to paralyze the accommodation.

The eyes of my patient were—except the slight hypermetropia—normal in every respect. Needless to say that there were no adhesions of the iris.

A KNIFE GUARD TO AID IN THE TARSAI SUBSECTION.

ARTHUR E. EWING, M.D.

ST. LOUIS, MO.

Since the publication of the article, "Improved Entropion Forceps" (*Ophthalmic Record*, October, 1907, and *Bulletin*, Medical Department, Washington University, vol. v, No. 4), my esteemed colleague, Dr. Post, has remarked that the manner of stitching the conjunctiva into the bottom of the wound made by the subsection of the tarsus and the tying of the sutures upon the skin surface was not very explicit. As it is essential to permanent results, particularly in the case of the lower lid, that these sutures be properly placed, the procedure is fully illustrated in the accompanying diagram, Figure 15, in which *a* is the "forceps stitch" and *b* one of the doubly-armed sutures, the needles of which are entered upon the conjunctival surface about two millimeters apart in the edge of the orbital or the standing portion of the tarsus, being confined as much as possible to the conjunctiva, then passed into the bottom of the wound back of that portion of the tarsus contained in the

1. De Wecker et Landolt, *Traité Compl. d'Ophth.* T. III, p. 511.

separated marginal strip and brought out in the skin at the base of the cilia, or among them, two and one-half or three millimeters distant from one another. At *b* is shown one of these sutures as they are tied upon the skin surface over the large No. 12 thread, *d*, which is laid along the lid near the margin to take the place of the



Figure 15.

quill in a quill suture. The course of the sutures which pass through the lid, as seen in a cross-section of the lid, is the same as is indicated by the thread, *b*, in Figure 8, of the above-mentioned article.

Should it be desirable to increase the clamping power of the forceps designed for maintaining the lid in an everted position, this may be accomplished by placing a wedge or a screw device between the junction of the fenestrated blades with the arms of the forceps and the intersection of the arms where they cross.



Figure 16.

As a further aid to these forceps in keeping the incision throughout its full length an even distance from the margin of the lid, thus securing uniformity in the width of the marginal strip of tarsus, I have added a guard, Figure 16, to the excellent knife devised by Dr. Green for the subsection, the action of which is to move along the border of the lid as the incision is made and hold the knife's edge a definite distance from the lid margin. It is

placed parallel to the knife, 2.5 to 3 mm. from the edge as seen from before backwards, and extends 2 mm. beyond the edge as seen from the side, except at the point, where it is shortened in order to not interfere with the incision being extended well into the angles; its width is about 3 mm. and its back has a curve similar to that of the edge of the knife so as to not obstruct the view of the operator on the side of the knife to which it is attached. Although originally intended to accompany Dr. Green's knife, it may be used with any knife that would ordinarily be employed for this incision.

THE EYE AND THE PELVIS.

CLARENCE PAYNE FRANKLIN, M. D.

PHILADELPHIA.

To present a subject academically to those whose knowledge is technical is to lay oneself open to the charge of sciolism.

To be learned among the ignorant is simple, but to be simple among the learned argues wisdom.

So, the academic being fruitful of the charge of pedantry, nevertheless be it preferred to dry technicalities, which make one only wish to be "the devil among the tailors"!

Here, then, are some thoughts on the relations between the ophthalmologist and the gynecologist, and let me begin by saying that the textbooks on gynecology contain far less material about these relations than do the eye-books, proving that though, as Gooddell taught, the good gynecologists have eyes at the ends of their fingers, nevertheless they do not have eyes at their fingers' ends; hence these tears!

And as a sop to the gynepods, let me say here, as says Maeterlinck: "I, myself, have now for a long time ceased to look for anything more beautiful in this world, or more interesting, than the truth; or at least than the effort one is able to make toward the truth."

Let this be my apology for making a plea for the more complete study of the recognized connections, and the more vigorous pursuit of new facts, demonstrating the relation of cause to effect between these two important parts of the body.

The inter-related pathological conditions of the eyes and the pelvis demand only the most casual inspection to show at once the possibilities as to causes in the one producing effects in the other; and while it is true that the causes of these associated symptoms lie mainly in the pelvis, and the effects in the eyes, nevertheless our attention as eye-men is demanded upon this subject in an endeavor to correct them—not always by interference

upon our part, but often in the form of an opinion only, and a reference to the gynecologist that he may do his part to reproduce the harmony demanded by Nature as a foundation for that ideal of health: "*Mens sana in corpore sano.*"

The subject of menstruation gives us interesting thoughts upon this important physio-pathological conditions, and all the facts we can bring to bear help to throw light upon that mystery, and will some day do their little part in solving a puzzle which has been a Minotaur's labyrinth awaiting the technical Theseus to solve its riddle.

While it has long been my experience in practice that any existing inflammation of the eyes grows worse during menstruation, Casey Wood puts it more clearly when he says: "The ophthalmologist will find that most eye symptoms are aggravated at the menstrual period, and this will serve to impress upon him the importance of considering the adverse nervous conditions, the malaise, and the insomnia particularly, with which he must reckon if he will successfully relieve the accommodative fatigue, the photophobia, the eye-pains, the extrinsic muscular anomalies, and the other ocular symptoms from which a certain class of women suffer."

Among the disturbances during the menstrual period, our patients frequently present to us cases of inflamed nerve-heads, optic neuritis, neuroretinitis; and even amaurosis has been seen by some observers, while the cases of the lesser afflictions, such as styes and conjunctivitis, are many.

Hysteric kopiiopia, as described by Foerster, characterized by pain behind the eyes or forehead, accompanied by photophobia and hyperesthetic phenomena, is a disease that, appearing spontaneously, is aggravated by menstruation.

Next, pregnancy, the great end at which Nature aims—the reproduction of the species—that intricately complicated mechanism that fills the contemplative mind with only awe and wonder—here, too, are possible derangements that affect the most delicate apparatus in the body even by the most roundabout paths.

The relation between the eye and the pelvis is probably best shown and in the most marked way in the albuminuric retinitis due to the kidney of pregnancy, or the amblyopia or even amaurosis of eclampsia.

Probably embolism of the central artery of the retina could with equal justice be placed under the same heading when due to the puerperal state.

Then the menopause, that equally mysterious process which occurs as the "lean and slippered pantaloons" phase of the seven stages of life—again here we find associated symptoms between

the eye and the pelvis which demand our, at least, passing attention.

That glaucoma has a relation to the menopause is a fact brought out by Hansell and Sweet in their admirable text-book, where they note its occurrence in women between the ages of 45 and 50.

As to pathological processes *per se* of the pelvis, one great symptom referred to both parts of the body under discussion is headache, that great curse of the modern woman, and the first thought devoted to it produces pictures that involve a discussion on the part of both the gynecologist and the ophthalmologist.

It is true that Thorington sounds a sane note when he says that, "the ophthalmologist must not think that because a patient has a headache that it is solely and always due to the eyes, and that glasses are going to cure it. It is for the ophthalmologist to find out just what part the eyes take in causing the patient's discomfort, and not always expect to cure with glasses headaches which have no direct relation to the eyes," and, while headaches frequently enough arise from gastrointestinal disturbances, malarial dyscrasias, or rheumatic conditions dependent upon many of the practically unknown metabolic imbalances possible to the human economy, a percentage of cases, nevertheless, sufficiently large to command our attention and respect do have headaches with referred ocular symptoms which increasingly demand our recognition of the existence of pelvic states that call for the opinion and interference of the gynecologist.

Headaches of the vortex seem to belong practically entirely to the gynecologist and his obstinacy in claiming them for his own, and "binding them to his soul with hoops of steel" becomes firmness only when his usual broad-mindedness prompts him to refer all other headaches to the general practitioner and the ophthalmologist.

Of course, eye strain causing reflex disturbances of the nervous system can be carried to its *reductio ad absurdum* of prescribing lenses for sterility!

The frontal, fronto-temporal, or fronto-occipital headaches of the third and most common or accommodative asthenopia may easily be confounded with the headaches of pelvic disorders; so much so that the general practitioner often sends such a case occurring in the female to the gynecologist, when the ophthalmologist could have readily landed upon the trouble fairly above the belt and knocked it out in one round of mydriatics.

Here follows a thought as to the influence of refractive errors upon pelvic conditions, and vice versa. The discussion of Fuchs

as to the difference between hypermetropia and presbyopia brings up the question as to the determination of the changes in refraction, if any, produced by the artificial menopause brought about by the gynecologist in removing the ovaries.

Here an interesting field presents itself, and the speculation as to whether the hypermetropia of maturity due to refractive defects becomes complicated by the possible production of presbyopia due to accommodative loss of power at an age earlier than that at which we naturally look for such changes, can be carried to a logical deduction, for, if the relation between glaucoma and the menopause, however obscure, can be proved, then why not an artificial senility of the lens in producing presbyopia from an artificial menopause?

That heartburn, nausea, vomiting, indigestion, constipation, and other gastrointestinal symptoms, with enuresis, nervousness extending as far as epileptiform attacks, insomnia, despondency, fear of impending trouble, can be and often are due to asthenopia, is proved by the fact that many such symptoms are relieved and cured by proper ocular measures of relief.

Irritability may be due to an unsmooth domestic *menage* or a pelvic *causus belli*, but it can also be very much caused by a pair of poorly constructed and overworked eyes, and while the obtaining of a gem of a domestic slavey, the removal of a pair of third-rate ovaries, and the adoption of a complication correction may hardly be classed under one heading as a sort of shotgun prescription, yet often the first two fail to work a cure in a condition that only the third as a last resort can relieve.

Again, the "absolute hypermetropia" of Donders produces headaches which must be taken into account when reckoning the balance between the eye and the pelvis. Retinal asthenopia, the rarest of the three forms of eye strain, may occur as a symptom of hysteria in a patient whose nervous system is deranged, and is therefore to be considered from the pelvic point of view when no history of prolonged use or overexposure to light and vibration is obtainable, and the same patient who tells the ophthalmologist that she can feel the heat of the reflected light of the ophthalmoscopic mirror, will tell the gynecologist of all kinds of obscure and impossible uterine and ovarian pains. To say that such patients are unsatisfactory to treat is phrasing it with the sweetness of the honey of Hymentus.

A word as to pathological conditions, pure and—not simple but—complicated, closes this already too didactic screed. Endometritis, the ophthalmologist may find, will present in the patient in whom it occurs, all the symptoms of asthenopia, with photo-

phobia, and pain occurring with occipital headaches, but a normal refraction. Anteflexions may produce the symptoms of headache and asthenopia also.

Trachoma infection may be a cause of kraurosis vulvæ—that queer atrophy in spots of the vaginal mucous membrane.

And finally, a secondary symptom of neuralgia of the ovary is, sometimes, amblyopia as one of the chain of progressive features of a hysterio-epileptiform convulsion—according to Garrigues, temporary in its duration.

And so, gentlemen, let this field be not merely one in which we go to grass, but rather an elysian field wherein we browse on succulent knowledge until such time as we may have explored it to its farthest confines, and reached that bourne where headaches cease from troubling and the pelvis is at rest.

121 So. Sixteenth Street.

A CASE OF OPHTHALMIC NEONATORUM FOLLOWED BY PYAEMIA AND DEATH.

FRANK N. LEWIS, M. D.

NEW YORK.

The absorption of pus into the general circulation from the ocular conjunctiva, and causing pyæmia, is sufficiently uncommon to warrant reporting this case of ophthalmia neonatorum. That such was the fact, and that death resulted from pyæmia, with inanition, it would seem that the history clearly shows. If there were other causes to account for the death, they were not of sufficient prominence to be apparent, although a careful search was continued for any symptoms, which would point to other causes. An autopsy was not permitted by the parents, so that, whatever might have been shown by this, could not be learned. Even had a complete examination after death been made, it might not have shown anything to change the opinion formed from the clinical history.

Lack of nutrition in babies, even without any suppurative disease, may lead to a fatal termination, and where, as in this case, a change from the mother's breast to feeding from the bottle is necessary, may have an unfavorable effect.

The nutrition in this case was looked after with perhaps more than usual care after pyæmic symptoms appeared and there is much credit due to Dr. H. B. Wilcox for his care, and daily interest in advising about the food and other means to sustain the patient.

The history of the case is as follows: The patient, a male, was born on May 6, 1907, and on May 9, an inflammation of both

eyes was noticed. The usual symptoms of ophthalmia neonatorum followed. Some local treatment was used, but on May 18th, when the baby was admitted to my service, at the Manhattan Eye, Ear and Throat Hospital, there was much swelling of lids of both eyes, with considerable purulent discharge.

The family physician reported that both the father and the mother had acute gonorrhoea, and some three weeks following the birth of the child, the mother, who was still quite sick in bed, was reported to have symptoms of salpingitis.

The baby, when admitted to the hospital, was a well developed, well nourished child; weighing 8 lbs.

The right eye showed swelling of the palpebral conjunctiva and chemosis, with a small spot of corneal ulceration, and a faint haziness of the entire cornea. The left eye was much the same with hazy cornea, but no distinct ulcer. Examination of the purulent discharge showed an abundance of gonococci.

The usual local treatment of the eyes was used—frequent cleansing with solution of boracic acid, iced applications, a solution of argyrol, 25%, every hour and once daily a solution of nitrate of silver, gr. x to \mathfrak{ss} . Solution of atropine, gr. i to \mathfrak{ss} , three times a day, was also used for three days, when the haziness of each cornea, with the ulceration on the right eye, had entirely disappeared.

Under this treatment the inflammation and discharge from both eyes subsided and on the tenth day after admission both eyes were quite normal in appearance with only scanty discharge and this showed extra-cellular diplococci. Later the pathologist reported that the examination of the ocular secretion gave a negative result.

On May 23d, five days after admission to the hospital, and while there was still discharge from the eyes, an abscess over the external malleolus of the right foot was opened, and \mathfrak{ss} of thick yellow pus evacuated, which on examination showed abundance of gonococci. The temperature, at the time this abscess was noticed, was 102° . The following morning the temperature was 99° .

On May 26, an abscess at the left elbow, and on May 27, one at the left steno-clavicular articulation were opened. May 30, an abscess at left knee was opened.

These abscesses were all of about the same character; very little redness of skin, and the site of pus deep seated. \mathfrak{ss} or \mathfrak{ss} of pus were evacuated and the microscope showed an abundance of gonococci in each. If there were other cocci, which might have any significance in the case, they were not found, although a careful

examination was made. On June 3 a small abscess at each wrist was opened, and on June 5 an abscess in the left axilla was opened and about 5ij of pus removed. Gonococci were present in pus from each abscess. On June 8th the child died, that is, three weeks after admission to the hospital, and when nearly five weeks of age.

The temperature chart showed a fairly characteristic one for pyæmia, up and down, 99° to 103° and 105° , and on June 5th, 6th and 7th, was subnormal, at times, with occasional elevations to 100° and 102° .

In spite of all efforts made, to keep up the nourishment, the child steadily lost in weight and strength. From 8lb. on admission, it was reduced to 6½lb on June 6th. At times it seemed to gain in strength, the cry to be stronger and on other days to be much weaker.

With such a clinical history it seems reasonable to say that the death was caused by pyæmia from absorption of pus through the conjunctiva. If some other explanation be the right one, it does not seem to me to have been clearly shown.

In quite a large hospital experience, with cases of ophthalmia neonatorum, extending over twenty-five years, I can recall no similar case. And quite a number of my confreres have expressed the same opinion. While I have not carefully gone over the literature on the subject, I feel that such cases are infrequent.

A somewhat similar condition perhaps is found in cases of gonorrhœa with subsequent arthritis, but even in these cases, I believe it is uncommon to have distinct abscesses.

It may be a singular thing that where there are so many cases of purulent inflammation of the eyes, as are seen in the larger hospitals, there are not more cases of pyæmia resulting, but such a condition is, I believe, seldom seen.

It was my experience that at about the same time that this patient was under my care at the hospital, there was another patient in my service, where distinct arthritis, but without any suppuration, followed an attack of gonorrhœal ophthalmia, and this not caused from urethral gonorrhœa in the same patient. As far as a most careful investigation in every way would show, the patient, a man, 30 years of age, did not have urethral gonorrhœa, but there was a severe gonorrhœal ophthalmia with loss of the one eye affected. A short time after leaving the hospital he was sick in bed with swelling, redness and pains in the knee joints. Whether or not this was caused by absorption from the ophthalmia, it might be hard to prove, but everything about the case seemed to so indicate.

Reports of Societies

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting Held in Denver, October 17, 1907.

DR. D. H. COOVER, Presiding.

Syphilitic Optic Atrophy.

Dr. W. C. Bane presented a case of typical double optic atrophy, following infection 18 years before. R. V. = hand movements, L. V. = 5/30; although the recorded vision of each eye was normal two years previous.

Dionin in Traumatic Cataract.

Dr. Coover re-exhibited the case of dislocated opaque lens shown by him before April, 1907, meeting of the Society. [See OPTHALMIC RECORD, August, 1907, page 388.] Four to 6 per cent dionin had been instilled into the eye daily for nearly four months, and 10 per cent daily for the succeeding two months. The lens was largely absorbed, and V. = 20/200 cum plus 10 D. sph. A portion of the lens and capsule remained.

Complete Albinism.

Dr. G. F. Libby showed a girl of 3 years, 8 months, with pink skin, white hair on scalp, brows and lids, and absence of pigment in iris and choroid. There was high astigmatism, lateral nystagmus, photophobia and low alternating convergent squint. The child was bright mentally, well developed, and the only albino in four generations at least.

DISCUSSION: Dr. Jackson said that incomplete albinism often improved as the child developed, but that when complete there was no development of pigment. He had usually seen marked errors of refraction in albinos.

Dr. Marbourg called attention to the entire edge of each lens showing through the thin irides, and advised the use of smoked glasses.

Dr. Neepor would have smoked glasses used from birth in these cases.

Dr. Black noted convergent squint of 3 mm., advised measuring the refraction, and would prescribe the correction required in toric amber lenses. Dr. Coover advised amethyst lenses.

Supraorbital Malformation.

Dr. Melville Black presented a child aged 2 $\frac{1}{2}$ years, born at natural term, face presentation. At birth the forehead and region of the eyes had been much discolored and swollen, pre-

sumably from resting on the pelvic bones, and the child had no eyelashes or eyebrows. He called attention to the almost complete absence of frontal prominences which accentuated the apparent protuberance of the forehead higher up; also to the ptosis, epicanthus, short lateral diameters of the palpebral apertures, and almost complete absence of eyebrows and eyelashes. By throwing the head back a palpebral opening of one-eighth inch was shown. The question was raised whether immediate operative measures should be resorted to, or should there be delay until Nature had done as much as she could toward restoring the contour of the bony parts of the supraorbital region.

Ruptured Globe.

An 8-year-old boy who had been injured July 4 last was shown by Dr. Black. The boy had touched off a loaded lead pipe which flew up, striking the bridge of the nose and the left eye. The nasal bridge was crushed in and the left eyeball ruptured, the rupture extending from 4 mm. above to 2 mm. below the cornea. The lens and a large amount of vitreous had escaped. The eye was shrunken to about one-half normal size, free from injection, and the upper lid could be only slightly opened from lack of bulbar support. Dr. Black had not removed the eye because he hoped that the globe might remain sufficiently large to promote development of the orbit, but stated that he considered further waiting of questionable value. He raised the question of the influence of this shrunken globe upon orbital development, and the expediency of its removal and the substitution of an artificial eye.

DISCUSSION: Dr. Chase had repeatedly seen children wearing an artificial eye show equal facial development.

Dr. Neepor had success in two cases where shell eyes were worn over old stumps, about one-third of the cornea being exposed in each case.

Dr. Strader reported the successful use of Thiersch skin grafts to replace the cornea.

In discussing Dr. Black's first case, Dr. Coover reported complete congenital ptosis and ophthalmoplegia in a boy of seven years; and a second case showing congenital ptosis, epicanthus and contraction of the palpebral commissure in a child whose two brothers and father showed the same condition.

Posterior Scleritis.

Drs. Stevens and Coover exhibited a case of extensive posterior scleritis. The patient was a male, 29 years of age, occupation that of boiler maker. Nine years ago his right eye had been

enucleated for an injury caused by a piece of steel penetrating the eyeball. In December, 1906, he contracted syphilis, the remaining eye became inflamed about two months later, while on a fishing vessel, and he received no treatment for the iritis until the vessel returned to port, four weeks after the onset of the eye trouble. He was treated by a general practitioner until May 15, when the patient entered the Denver County Hospital. At this time his vision was light perception. The eyeball was reddened and painful. The iris seemed everywhere adherent to an opaque lens, and the upper and inner quadrant was covered by a mass of spongy exudate. On rotating the eyeball upward and downward several large ectasias of the sclera were partially exposed. Transillumination showed these scleral protrusions to be translucent. The tension was about plus 1.

Under ether an iridectomy was performed and the opaque lens removed by curettement. The relief from pain was immediate, and in about ten days the patient left the hospital with the eye white and quiet.

Mercurial inunctions were employed during the time the patient was in the hospital, and potassium iodid was given in increased doses. No improvement in vision resulted: the loss of sight being due to the numerous scleral ectasias of the posterior half of the eyeball.

Unusual Corneal Traumatism.

Dr. E. R. Neepser reported severe keratitis resulting from abrasion of the cornea from a whisk brush used by a boot-black in brushing a customer's clothes: and Dr. Libby, a mild keratitis caused by abrasion from bristles of a tooth brush, which slipped as the patient was brushing his teeth.

Foreign Bodies in the Cornea.

Dr. G. H. Strader reported three unusual cases of this character: 1. A patient had presented himself with, apparently, a foreign body in the cornea, just below the pupil. Efforts at removal proving fruitless and the magnet test being negative as to iron, the diagnosis of rust-stain was made. Later this staining increased, raising the question of the presence of an oxidizing metallic substance.

Dr. Jackson suggested that the cornea might still contain a non-magnetic alloy of steel, which should be searched for.

2. Patient reported that a physician had removed steel from his cornea. Later there developed cataract, discolored iris and slightly raised tension. Sodium salicylate, grains 150 in ten

hours, was given, followed by relief from pain and tenderness. Recurring pain was relieved by withdrawal of pus from the nose, by suction. An abscess was found at the root of an extracted tooth.

3. Fragment of iron removed from cornea two days after its lodgment.

A dendritic ulcer formed two days later, with hypopion and stippled cornea. K. I. was ineffective, but subconjunctival injections of 1:2000 oxycyanid of mercury was followed by clearing of the hypopion. Pannus, interstitial opacities and disciform keratitis developed with calcareous central deposit which did not disappear with curetting. Treatment by yellow oxid ointment and heat was in progress.

Dr. Marbourgh stated that iodine vasogen, with K. I., had helped a similar case in his practice.

Dr. Coover had touched undermined margins of similar ulcers with saturated potassium chlorate solution, and given cod liver oil, with resulting recovery.

Foreign Bodies in the Globe.

Dr. A. C. Magruder reported lacerated wound of eye caused by the butt of a falling corn stalk. The anterior chamber soon filled with pus, for which irrigation was no help. Enucleation in two weeks, when the vitreous was found full of pus.

Dr. Libby reported a case in which a chip of steel had nicked the lid, passed through the sclero-corneal junction and periphery of the iris, and lodged in the vitreous. On first examination, the day following the injury, the cornea was steamy and conjunctiva edematous, and pain evidently severe.

The steel was at once extracted through an incision below the external rectus, by aid of a magnet. The eye looked worse on the following day, and pus appeared in the anterior chamber. The conjunctival sac was filled with iodoform powder, to no purpose. Five days after the accident, enucleation became necessary. A rope of pus was found extending from the corneal wound through lens and vitreous.

Dr. Jackson reported (1) an old case of suppurative hyalitis following foreign body in the vitreous, necessitating enucleation. (2) Eye injured last February. In July trials by the giant magnet on five different days demonstrated iron within the eye. X-rays showed a foreign body present. Failing to get the metal on the Johnson magnet point, Dr. Jackson attached scissors to the magnet, cut through an encapsulating exudate, and removed the steel on

point of scissors. In three days the patient was comfortable, in ten days vision rose from $2/100$ to $4/9$ partly.

Dr. Stevens reported two cases of steel in the vitreous in which enucleation showed the vitreous disorganized and filled with pus in 48 hours: and a third in which the eye was saved by removal of steel from vitreous.

Dr. Coover reported three pieces of copper shown in an eye, by X-rays.

Dr. Black considered penetrating wounds less likely to infection than contused injuries.

Dr. Walker would take chances on sympathetic inflammation for a time, in suppurative hyalitis. If the foreign body penetrated the lens, he would remove the lens, establish drainage, and endeavor to save the injured globe.

Meeting held in Denver November 16, 1907.

Dr. EDWARD JACKSON, Presiding.

Symposium on Blood Pressure and Arteriosclerosis.

Etiological Importance of the Alimentary Canal in Relation to Vascular Pressure.

Dr. Edward C. Hill read this paper, indicating five general ways in which alimentary disorders may effect blood pressure, namely: autointoxication, infection and inflammation: pressure and obstruction reflex inhibition of function, and malnutrition. He said that self-poisoning from the stomach and bowels ranked first in frequency and importance, and had found that nearly all his cases showing marked indicanuria had subnormal vascular tension.

Dr. Hill stated that all toxic substances absorbed from the alimentary canal exerted a sclerogenic action upon the blood vessels, which might lead eventually to arteriosclerosis and high blood pressure. In fevers there was rise of tension at first, lowering later. One of the lowest (64 mm.) readings which he had encountered was associated with extreme chronic gaseous distension of the bowels.

Malnutrition obviously leads to subnormal blood pressure. In the great majority of chronic pathologic conditions of the alimentary tract, neurasthenic vascular hypotension was present, and with correction of such morbid states vasomotor tone would rise.

Association Between Chronic Nephritis and Increased Vascular Pressure.

In this address Dr. James R. Arneill mentioned the intimate relation between the heart, arteries and kidneys, and the importance of using a sphygmomanometer with a standard (12 cm.) cup in taking blood pressure.

Physicians marvelled that men with hard, pipe-stem arteries lived to be ninety or one hundred, until the blood pressure was studied and found low in these cases. On the other hand, apoplexy associated with no sclerosis appreciable to palpation caused surprise until similar study revealed high tension. In epilepsy low pressure was found. Apoplexy with high tension indicated uremia.

Dr. Arneill thought Janeway had given the best explanation of high pressure in chronic interstitial nephritis by attributing it to hardening of the media and intima of the splanchnic arteries; and said that authority suspected chronic Bright's disease in high (180-200 mm. plus) tension, putting more reliance on it, especially with attendant cardiac signs, than on urinalysis.

In chronic parenchymatous nephritis pressure was usually high, in acute nephritis slightly raised, and lowered in amyloid disease and cyclic albuminuria. Hypertonia, with no arteriosclerosis, was an early stage benefited by treatment. Rarely in chronic parenchymatous and chronic interstitial nephritis the pressure may be low. Even 180 may be low in some cases, indicating weakening heart. Not pressure but the case was to be treated.

Under treatment Dr. Arneill suggested light lacto-vegetarian diet, lessened purins, baths, massage, regulated exercise and possibly small doses of thyroid extract, along preventive lines: digitalis as an adjuvant, and amyl nitrite, and nitroglycerin in emergencies.

General Effects of Arteriosclerosis and Its Tendency to Localize, If Any, and to What Extent.

In this paper Dr. George A. Moleen described two forms of sclerosis, the diffuse and the nodular. Uniform thickening caused general lack of elasticity, diminished lumen of the vessels, and increased blood pressure; while irregularly distributed thickening gave local effects. When the vessels were deprived of uniform elasticity as a result of external fibrosis, aneurism or rupture might be expected, whereas patches of thickening affecting coat would seem more likely to cause thrombosis. However, either variety might exist in all palpable vessels without appreciable disturbing symptoms.

Dr. Moleen stated that increased blood pressure usually accompanied, and was thought to cause, arteriosclerosis; normal systolic pressure averaging 125, and diastolic 29 mm. The diminished calibre of the vessels caused anemia and defective metabolism.

Diffuse and nodular arteriosclerosis showed selective localizing tendencies quite opposed to each other in all except the cerebral arteries, which were about as often involved with one form as the other. Nodular fibrosis seemed to affect the aorta preferably, causing aneurism; while diffuse sclerosis of the renal capillaries was related to chronic interstitial nephritis, with its high tension.

In conclusion, Dr. Moleen said that the general effects of arteriosclerosis were vascular and visceral. In the former they consisted in loss of arterial elasticity, deformity, tortuosity, obliteration, aneurism, thrombosis, high arterial tension and rupture. In the latter they occur in the heart, brain, kidneys and other organs.

Ocular Effects of Alimentary, Renal and Cardio-Vascular Disease.

This was the subject of a paper by Dr. E. W. Stevens, who said that disorders of the alimentary tract played an important role in ocular pathology. Phlyctenular disease of the conjunctiva and cornea was closely associated with disorders of nutrition; while subconjunctival and retinal hemorrhages might be produced by straining at stool. Most ocular inflammations, as acute and chronic catarrhal conjunctivitis, were improved by cathartics. On the other hand prolonged gastrointestinal catarrh in infants might lead to corneal ulceration from impaired nutrition. It was highly probable that many diseases of the uveal tract were due to intestinal autointoxication. In the absence of other evidence of infection in these cases, the alimentary tract should be suspected, and calomel and intestinal antiseptics administered. Errors of diet and intestinal fermentation or putrefaction might be an important factor in producing ocular lesions by bringing about arteriosclerosis, the first signs of which might be revealed by the ophthalmoscope.

Dr. Stevens called attention to edema of the lids, especially temporary swelling of the lower lids, as one of the earliest forerunners of parenchymatous nephritis, often accompanied by anasarca. One of the most striking symptoms of renal disease was uremic blindness; usually sudden, bilateral and complete, and with restoration of vision in 12 to 24 hours, up to a week. This blindness was most common in acute nephritis, as in scarlet fever, pregnancy and after exposure to cold.

The most common ocular manifestations of renal disease were retinitis and neuroretinitis, most frequently met in chronic Bright's disease, but not uncommon in chronic parenchymatous nephritis and albuminuria of pregnancy. The nerve head was variously affected, from hyperemia to "choked disc." The retinal lesions included edema, whitish degenerative patches about the macula, hemorrhages and exudates. Of even greater importance were the changes in the contour, size and general character of the retinal vessels.

It was stated that changes in the capillary circulation and in the smallest retinal arteries and veins, combined with high arterial tension, were noticeable before albuminuria or other sign of renal disease became manifest. On the other hand some cases of nephritis presented no retinal changes. Groenouw's statistics of 22.4 per cent of retinal lesions in 935 cases of nephritis probably represented fairly well the proportionate involvement of the retina. Statistics of many hundred cases showed that a large majority presenting retinal lesions died within a year after the retinal manifestations were discovered, excepting only the exanthemata and albuminuria of pregnancy.

As to ocular effects of cardiovascular disease, Dr. Stevens mentioned aortic regurgitation as frequently causing pulsation of the retinal arteries, cardiac dilatation causing tortuosity of retinal veins, endocarditis sometimes causing embolism of central artery of retina, aneurism of aorta or innominate artery giving rise, at times, to embolism of central retinal artery, dilatation of the pupil and widening of the palpebral fissure. Palsies of the external ocular muscles might occur from aneurism of the internal carotid, and pulsating exophthalmos if rupture into the cavernous sinus occurred.

In the eye vascular changes were displayed with a clearness and minuteness nowhere else obtainable in life, and indicated the general state of the blood vessels. Gunn had reported fourteen cases of intraocular vascular disease in which cerebral hemorrhage subsequently occurred. Yet, it must be admitted, angiosclerotic processes were generally very irregular in distribution. It was evident that disease of the retinal vessels was not positive proof of disease in any other vascular area, or that absence of retinal changes proved healthy arteries elsewhere. The retinal vessels might also be diseased without ophthalmoscopic evidence.

But with these reservations the ophthalmoscope still remained the best indicator of the state of the vessels generally. In all cases the evidence furnished by rigidity of the peripheral vessels,

high arterial tension, cardiac hypertrophy, character of heart sounds, and the readings of the sphygmomanometer and sphygmograph, must have due weight.

The difficult diagnosis of the *early* stage might be made by noting a brick-dust color of the papilla, uneven caliber and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, unusually light color of the breadth of the arteries, and alteration in the course and caliber of the veins. Middle-aged patients showing these signs should be recommended to thorough general examination. If the eye ground examination is thus confirmed suitable treatment might prevent or retard the development of arteriosclerosis, with its disastrous consequences. When the fundus showed such positive changes in the size and breadth of the retinal arteries that a beaded appearance was produced; or perivasculitis in the form of white lines along the vessel walls; alternate contraction and dilatation of the veins; particularly indentation of the veins by the hardened arteries, they assumed a positive diagnostic importance not surpassed by the four important clinical symptoms of arteriosclerosis.

DISCUSSION: Dr. O. M. Gilbert said that we were just realizing the importance of this enormous problem. Hypertension, which might be compensatory, and arteriosclerosis were not necessarily associated, but were more often than generally believed. In the old, lack of cardiac force might preclude high pressure. He would save the patients suffering from hypertension, by restriction of exercise and by relieving the heart's action otherwise.

Dr. J. A. Patterson had observed dull retinal reflex and tortuous veins, due to gastrointestinal disturbance, improve as the digestion improved, from withdrawal of offending articles of diet, as tea or coffee.

Dr. Bernard Oettinger stated that arteriosclerosis might begin in any vascular coat, that its bad effects and tension were variable and due to many causes. He believed metabolic changes and intoxication preceded arteriosclerosis, and had noticed far different effects from syphilitic arteriosclerosis than from that with other causation. He would eliminate toxins, reduce purin and give iodine, which he had found efficacious.

Dr. C. E. Tennant believed in an organic or toxic cause for arteriosclerosis, and said that the study of blood pressure revealed many surprises. He had seen pressure of 149 to 150 in a chronic beer-drinker in whom albuminuria twice appeared.

Dr. Edward Jackson stated that Dr. Moleen, like other

observers, had noted the effects on the large trunks, which were in a different class from the retinal vessels. We would get more and earlier information from study of the smaller vessels. Recent statistics attributed high blood pressure to age, syphilis, excessive use of tobacco, and, least of all, to alcohol.

Dr. Jackson reported albuminuria retinitis of first pregnancy at age of 27. There was severe uremia, much albuminuria, premature delivery of a dead fetus, followed by blindness. After four months vision had returned to normal, there were no hemorrhages or white spots or chorioidal atrophy, but the chorioidal vessels were plainly visible. In a fundus known to have been normal before confinement, there was atrophy of the retinal pigment layer and massing of the pigment in specks in the outer two-thirds of the visible fundus, and the chorioidal vessels showed the yellowish white appearance indicative of sclerosis. There was no albuminuria or abnormal blood pressure at this time.

In closing the discussion Dr. Hill said that irritation of adrenal glands and liberation of adrenalin into the circulation was the probable cause of high tension in chronic Bright's disease. He had found strophanthus good to lower the pressure, and aconite to slacken the circulation.

Dr. Moleen believed that increased tension and arteriosclerosis preceded rather than followed chronic interstitial nephritis, and that albuminuria depended on constant and continued high pressure. He advocated iodine and rest as therapeutic means.

Dr. Arneill advocated digitalis rather than strophanthus. In case of doubt as to presence of hypertonia or arteriosclerosis he would give amyl nitrite to establish diagnosis. If the blood pressure fell in ten minutes he would consider no marked arteriosclerosis present, but hypertonia, which was likely to be helped by treatment. Increased blood pressure and arteriosclerosis might be separate or combined. Heredity had a marked effect, sometimes developing these changes at 30 years. He believed the good effect of iodine was due to its alterative action on other parts of the body.

Dr. Stevens related a case, previously reported, of retinal hemorrhage. He had later passed successfully a life insurance examination, but died one year later from apoplexy. He had examined twenty-four men ranging from 18 to 100 years, finding arterial fibrosis but no increase of blood pressure. He usually had found arteriosclerosis unaccompanied by increased tension, and with sclerosis and high pressure had often found no albuminuria.

He emphasized the need of following up the case of arteriosclerosis, carefully noting change of caliber and tortuosity of the vessels.

Keratitis Profunda.

Dr. Melville Black presented Mrs. T., aged 58, first seen twelve years before. Three weeks earlier still she had noticed a dimness of vision of the left eye, which gradually increased. There was complaint of pain and an inflamed eye. When Dr. Black first saw her the left eye was inflamed and photophobic, and the cornea had the appearance of ground glass. Tension normal. Vision, fingers at 2 feet. Atropin, hot applications and galvanism were used locally, and iodid of potassium internally. The cornea cleared in about two months and a half, with resulting vision of 20/40. The present attack had begun about two and a half months previous. Dr. Black saw her about seven weeks later, and found the left eye in the same condition as when first seen, twelve years before. He prescribed atropin 4 times daily and 5 per cent diosin salve at bed time. He saw her two weeks later and found the pupil well dilated and the cornea very much more transparent.

When shown before the society the cornea showed some loss of transparency and a general nicked appearance.

GEORGE F. LIBBY, Secretary.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, November 14, 1907.

R. MARCUS GUNN, F. R. C. S., President, in the Chair.

Interstitial Keratitis from Acquired Syphilis.

Mr. J. Herbert Fisher read a paper on Some Cases of Interstitial Keratitis from Acquired Syphilis. Before reading notes of four cases which he had personally observed, he expressed his surprise that so few instances of interstitial keratitis from acquired syphilis had been brought before the Society, this was the more regrettable seeing that Mr. Jonathan Hutchinson, when vacating the presidential chair, had especially directed the attention of members to this subject as one upon which information might usefully be collected. The textbooks dismissed the subject with very brief reference, and gave no authoritative statements as to frequency, date of onset, severity, and prognosis of the disease. After reading notes of his four cases, and alluding to one of corneal inflammation which rapidly followed the primary inoculation of syphilis on the lower eyelid, Mr. Fisher expressed his opinion

that interstitial keratitis from acquired syphilis was generally a tertiary manifestation; that it appeared usually to attack only one eye, and that the infiltration frequently limited itself to a portion only of the cornea—that the keratitis, as far as it went, was identical in clinical appearances with that due to inherited disease, and that the statement which had been made by Nuel, that it was usually secondary to irido-choroiditis, was by no means universally accurate. Mr. Fisher further read notes of a case of interstitial keratitis in the child of a mother who had herself inherited syphilis, and who had in consequence suffered from kerafo-iritis, with choroiditis and deafness. The question of the transmission of syphilis to the third generation was raised upon this case: assuming the husband of a woman, who had inherited syphilis, to have acquired syphilis, the point was raised whether one was more, or less, likely than a wife free from inherited taint, to bear syphilitic children to him. Other practical points of discussion were raised, and members were invited to contribute their experiences, in hope that evidence might in time be obtained which would be of guidance both to ophthalmic and general surgeons, in answering the questions which might be addressed to them as to the advisability of marriage by patients who were the subjects either of inherited or of acquired syphilis.

Ligamentum Pectinatum Iridis.

Mr. Thomas Henderson (Nottingham) read a paper on the Anatomy of the So-called Ligamentum Pectinatum Iridis, and its Bearing on the Physiology and Pathology of the Eye. He stated that the so-called pectinate ligament was a part of and belonged to the sclera. The principle on which it was constructed was perfectly simple, being exactly the same as that which obtained in the fibers of the neighboring tissue in which it lay, as an open network, composed of non-sclerosed interlacing fibers, which were in direct continuation with the circular and longitudinal bundles of the sclera surrounding the venous sinns of Schlemm's canal. The circular fibers were made out in tangential and transverse sections of the pectinate ligament, while the longitudinal fibers were seen in radial sections. The criterion of a true radial section was that it showed the anatomical connection and continuation, often suggested, but hitherto never yet demonstrated, of the hyaline layer of the ciliary body with the posterior limiting layer of the iris. Arising as a continuation of the innermost lamellae of the cornea, the pectinate ligament could be divided into (1) a small outer or scleral portion, where fibers at the posterior end of

Schlemm's canal became lost in those of the sclera, and (?) an inner larger or ciliary division, which could be still further subdivided into (a) a portion which pierced the scleral ring to give attachment to the meridional fibers of the ciliary muscle, (b) a part which passed internal to the scleral ring to terminate in the connective tissue stroma of the circular portion of the ciliary muscle. None of the fibers of the ligament turned round into the root of the iris, as was described but this appearance was the result of an oblique section, and emphasized again the importance of studying only true radial preparations. The iris root was attached to the circular bundles of the ligament at a point just posterior to the scleral ring, which attachment to the ligament was quite a different matter to fibers of the ligament being said to bend round into the iris, which they did not. He considered that the term *ligamentum pectinatum iridis* was thus not only altogether inappropriate, but also wrong and misleading, as in man it was neither a comb-like structure, nor was it a ligament to the iris. On this account, and because of its reteform or cribriform structure, and further, on account of it being a ligament in the true sense of the word to the two portions of the ciliary muscle, the term "cribriform ligament of the ciliary muscle" was much more appropriate. This ligament showed a most marked histological difference in its structure and nature at different periods of life. In youth it was cellular, while as age progressed it became more and more fibrosed. It was this physiological sclerosis in excess that he considered was the fundamental *causa causans* of primary glaucoma, in the causation of which two factors must be separated—the one constant, the other accessory. The first and constant factor was sclerosis of the filtration network and a consequent diminished outlet. The second, and variable agent was vaso-motor in nature, and it was this which determined the acute attack, in which there was superadded to the first an inflow out of proportion to the available and already reduced channels of exit from the eyeball. Viewed in this light, the whole phenomena of glaucoma, clinical and pathological, could be explained. A closer study of this sclerosis of this filtration network gave a clear view of the process of development and stages of formation of connective tissue, with definite histological proof that white and elastic tissue was not a direct conversion of the cell protoplasm, but was derived indirectly from alteration and transformation of a homogenous substance which was itself the product of cellular activity. The alveoli of the filtration network were connected with the lymph spaces of the cornea and sclera,

whose fixed corpuscles were brought into direct association with the endothelial cells of the anterior chamber. It was in consequence of this anatomical continuity that the cornea, by diffusion, received its nourishment from the aqueous. This fact would explain a great deal, and would have the utmost bearing on the pathology of corneal diseases.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The President's Introductory Address.

Mr. Gunn first tendered his warm thanks to the Society for the honor implied in his election to the presidential chair, and assured the members that he yielded to none in feelings of loyalty to the Society, whose interests he would do his best to serve. The first portion of the address was devoted to a review of the history of the Society, dating from the issue of a circular letter in February, 1880. He referred to the most important contributions to the transactions, under various headings—physiological, surgical, clinical, pathological, etc. Passing on to the future he said an exact knowledge of the etiology of affections of the cornea, iris, and choroid was much wanted, while they awaited an explanation of recurrent retinal hemorrhages in eyes otherwise seemingly sound, in persons whose general health was not manifestly at fault. If a diminished coagulability of the blood were found to be present, and that was kept at bay, it was reasonable to expect that the recurrence due to that cause would be checked; but such treatment had been disappointing. Opacities in the lens occasionally presented forms which did not seem explicable at all by our knowledge of its anatomy or its nutrition. Could those be accounted for? Prognosis was a very important matter to the patient, yet it was often uncertain, and must continue so. Yet if the ophthalmic surgeon knew a little more of the true nature of the different diseases which he had to treat his knowledge of their course and duration would be materially increased. In the past few years great advance had been made as to the nature of infective agents, and the ways in which the body attempted to free itself from invasion.

There was the whole army of bacterial poisons, with their antibodies, and ophthalmic surgeons must know sufficient to be able to intelligently follow the reason involved in serum and vaccine therapy. If it was useful in their specialty they must inquire when and how far, and how it should be employed. With regard

to medicinal treatments, he hoped they would keep their armamentarium as small as possible without the sacrifice of efficiency. Too many drugs were a weariness of the flesh, both to him who gave and him who took. He thought the Society might well revert to more frequent committees and discussions, as in the earlier history of the Society. He referred to the large number of card-specimens now shown before the Society, many of them of great interest and importance, but members did not seem able to take full advantage of them, and their very number was the cause of that inability, for they could not see all, if indeed they could see any satisfactorily, in half an hour in a crowded room. The institution of clinical evenings was quite an advance, but much still remained to be done. It would be well to have standing committees for men interested in special lines of work, whose duty it would be to report upon any case, when the member showing it approved. Of such committee the exhibitor would be a member for the time being.

A Case of Tumor of the Optic Nerve.

By Mr. J. B. Lawford. The patient was a female, aged 38, single, who came under observation in June, 1906. The eyelids on the left side were puffy and slightly red; there was a moderate degree of proptosis, the displacement being almost directly forwards. The movements of the eyeball upwards and outwards were restricted, rotation downwards and inwards full. No edema, and but slight vascularity of the conjunctiva. No tenderness on pressure; nothing abnormal in the orbit; no pain, but some discomfort. Vision was reduced to perception of light. The media was clear, the optic papillæ ill-defined and pale, and the retinal veins tortuous. No hemorrhage nor disease of the choroid. The family history was good, the patient was a healthy, robust woman, and tubercular and syphilitic disease could be reasonably excluded. There was no history of injury. Something amiss was noticed in the left eye four years previously, and in April of that year she consulted Mr. Wherry, of Cambridge, who recorded the vision on that date as follows: R. 6/6; L. 6/18, but with correction of hypertrophic astigmatism, 6/9 partly. The patient was seen by another ophthalmic surgeon during 1903-4, and was under treatment by drugs for some months, but there was no improvement in the symptoms. The diagnosis made in 1906 was (?) tumor of optic nerve sheath, (?) osteoma of orbit. Treatment by iodid of potassium was advised, and was carried out for some weeks, but without benefit. In July, 1907, there was a slight but notice-

able alteration, the proptosis had increased, the movements of the globe were much restricted in all directions, the pupil was inactive to light, and there was no perception of light. The patient could not state how long the blindness had existed. No hemorrhages could be distinguished, the retinal veins were tortuous, there was no tenderness, no tumor could be felt, nor deep pulsation detected by the finger. The proptosis could not be reduced by pressure. There was no severe pain. The general health did not appear to be prejudiced by the orbital disease. Operation was advised. Three days later the patient was seen by Sir John Tweedy, who thought it was either osteoma of the orbital wall, or tumor of the optic nerve, probably the latter. In June, 1907, the eyeball and tumor were removed. The tumor extended from the back of the eyeball to the apex of the orbit, and the nerve was divided as close to the optic foramen as possible. There was extensive hemorrhage into the orbital tissue; the swelling gradually subsided, and she left the nursing home a fortnight after the operation. Fifteen similar cases had already been recorded, which was in contrast to the number of cases of primary intradural tumor of the optic nerve, which numbered 102 up to 1901. The age of his own patient was about average. The microscopical characters of the growth were described and demonstrated by Mr. George Coats.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular Meeting held November 11, 1907.

Dr. F. C. Hotz in the Chair.

Tumor of Pituitary Body.

Dr. Casey A. Wood reported a case of probable tumor of the pituitary body exhibiting bi-nasal hemianopia occurring in a woman. The visual fields were characteristic and the skiagraph which was taken of the skull showed an enlargement of the sella turcica and considerable increase in size of the pituitary body. One of the interesting clinical features of the case was the absence of menstruation.

DISCUSSION: Dr. Henry Gradle has seen six or eight cases of bitemporal hemianopsia in the past eight years. One of the patients was a woman and she did not menstruate for at least one year. On looking up the literature on the subject, Dr. Gradle found mention made in a number of instances of probable or suspected tumor of the hypophysis of interference with menstruation in comparatively young women. Five of his patients presented

striking appearances of the skull, and one patient had the so-called leonine face. Dr. Patrick examined this patient and found a general condition of infantilism, especially about the genitalia. The man was about 26 years old. Mentally he was unusually well developed. He was under observation for about a year and a half and during that time the visual atrophy and deterioration of sight did not increase, so that, undoubtedly, the condition was relatively stationary for a while. This was not a clear-cut case of hemianopsia. In another case the condition was stationary for a year at least, if not three years. This patient presented the symptoms found in cases of fibroid tumors of the epipharynx, the so-called frog face. Another patient died, presumably from the effects of the tumor, but a post-mortem was not made. The case began at the extreme temporal periphery in both eyes and gradually became a bitemporal hemianopsia, remained stationary for a few months, and then increased to complete atrophy. It evidently was a case of intracranial tumor, but a postmortem was not made.

Dr. W. H. Peck has seen four cases of tumor of the pituitary body. In one case there was an enlargement of the sella turcica, and the woman later developed a terrific headache, to relieve which an operation was done. A portion of the right parietal bone was removed and that gave the patient considerable relief, but she died subsequently. In this case there was found a gangrene of about twelve inches in the intestine, and Dr. Oscar King, who saw the patient in consultation, thought that this was a very rare complication, something he had never heard of before. Another woman who had a bitemporal heminaopsia lived about three years. In a third instance the condition followed an ovariectomy and menstruation did not take place again after the operation. About a year later the tumor of the pituitary body developed and the woman died after several months. Dr. Peck now has under observation a case that presents many of the symptoms cited by Dr. Wood, except that instead of being binasal it is bitemporal. The lady has enjoyed very good health until about a year ago, when she had very severe headaches, and since then there has been very little change in the bitemporal hemianopsia, but the patient has been actively engaged in business all of the time, which Dr. Peck thought worthy of mention.

Dr. E. F. Snyder saw a case with Dr. Sidney Kuh which presented a symptom not uncommon in tumor of the pituitary body, the passage of enormous quantities of sugar in the urine.

He suggested that inasmuch as diabetes is a very common complication, eye symptoms may manifest themselves which possibly are due as much to the diabetes as to the tumor. In the case he mentioned there was a mature cataract in each eye, probably due to the diabetes and not to the acromegaly. Light perception was completely gone in one eye, and only the outer portion of one field was left. Dr. Snyderaker pointed out that according to the text-books it seems easy to diagnose tumor of the chiasm and tell whether it is pressing on the nasal or temporal portion. A tumor pressing so as to produce a heteronymous diplopia seems impossible of explanation. Pressing on the nasal portion of the chiasm should produce bitemporal hemianopsia, or if you have tumor cutting off one nerve lower down it should produce complete blindness. He asked Dr. Wood for his theory as to the production of heteronymous diplopia.

Dr. Frank Allport has under his care three cases of acromegaly occurring in children. They are semi-idiotic and it is impossible to examine their eye fields because of their nervousness and restlessness. The first child seen is a girl. The second is a boy whose mother was a sister of the father of the first patient. The third patient, also a boy, was related to the first child. His mother was a sister of the mother of the first patient, so that there was no family relationship between the two boys. All three patients had congenital cataracts.

Dr. Casey A. Wood, in closing, stated that he did not believe that any one but an expert should attempt to interpret a skiagraph, even though the changes shown may appear to be very definite. It is the duty of the radiographer to give his opinion in the case, and being an expert in such matters, his opinion ought to be relied on. In Dr. Wood's case the radiographer, Dr. Reichmann, gave it as his opinion that there was an enlargement of the sella turcica and evidence of tumor of the pituitary body. So far as operation is concerned, Dr. Wood could not see how a mere opening of the skull could do any good, except to relieve pressure; nor does he believe it to be rational to do a spinal puncture or to open the skull and go into the brain tissue. Of course, successful operations have been done on the pituitary body, but thus far only by Sir Victor Horsley of England, but so far the efficacy of an operation is still questionable. Dr. Wood did not agree with Dr. Snyderaker as to the difficulty of understanding binasal and bitemporal hemianopsia if one considers the course of the optic fibers, but he does think that the imagina-

tion must be called on to suppose that tumor does press on something. There must be and probably is an actual destruction of nerve fibers supplied to different parts of the globe, but one must imagine not only destruction of these particular fibers but of the fibers that are supplied to other parts. In Dr. Wood's case there is a beginning atrophy of the whole nerve and he gave it as his belief that the woman will eventually become totally blind.

Case of Almost Complete Iridodialysis.

Dr. E. F. Snyder reported the case of a man who in stooping suddenly struck his right eye on the back of a chair. Immediately his sight was gone and vision did not return. He suffered great pain. When seen three or four weeks after the accident it was evident that there had been a rupture of the choroid. There was a large scar 3 or 4 millimeters above the limbus. The iris was completely torn away above and had settled in the lower portion of the eyeball. The pupil was a small black spot. The anterior chamber was very deep. The lens evidently had been dislocated or had come out of the eye entirely, or it may have been subconjunctival or down in the vitreous. The iris is tremulous, showing that the lens is gone. At first the eyeball was very soft; now it is very hard. According to one theory, when the cornea receives a blow the lateral diameter of the eye is suddenly increased. The iris cannot accommodate itself to this increase and the pectinate muscle is torn from its attachment. Another explanation, and in Dr. Snyder's opinion the latter one, is that when the eye is struck violently the aqueous is forced backward and the weaker portion of the iris is the most likely to yield, and an iridodialysis results.

Dr. Snyder also mentioned briefly a litter which he has designed to carry patients from the operating table without disturbing them.

Congenital Coloboma of Upper Eyelid.

Dr. W. O. Nance exhibited a nine-months-old girl, of Danish parentage, exceedingly well nourished and well developed, except for a unilateral coloboma of the upper left eyelid. The fissure was situated near the median line of the lid, somewhat to the nasal side. There was no other malformation present in the child. Ophthalmoscopic examination was negative, except that the eye was hyperopic to the extent of three or four diopters.

Sarcoma of Chorioid.

Dr. W. E. Gamble reported the case of a man who complained of failing sight and flashes of light, becoming more frequent and

more constant. The personal and family history were negative. The eye was normal externally. The ophthalmoscopic examination revealed a detached retina on the temporal side, extending from the region of the disc forward almost to the ora serata, cyst-like in appearance. Only with great difficulty could there be detected any movement of the retina in changing the position of the head. Tension was minus. Transillumination was negative, but a diagnosis of suspected sarcoma of the choroid was made. Later the patient had violent pain in the eye; the pupil was widely dilated, and there was present superficial venous congestion, with a plus one tension. The eye was removed and the tumor proved to be a round cell sarcoma of the choroid. Dr. Gamble emphasized the fact that in intraocular tumors during the first stage the tension may be minus.

DISCUSSION: Dr. Casey A. Wood thought that the diagnosis of intro-ocular tumor is not as easy as is stated in text-books, as is shown by Dr. Gamble's case. A man with a good personal and family history shows a distinct minus tension without any localized injection or other evidence of tumor; but, he continued, the microscopic section explains the practical impossibility of making the diagnosis. The character of it, the implication of follicular tissues, the commencement in the posterior part of the eye, and its small size explain it all. These tumors have been called crypto tumors. They are associated with exudates in the vitreous so that even when it is possible to examine the tumor closely a definite diagnosis can not be made, as in this case. Dr. Wood would call this crypto-sarcoma. He suggested that skiagraphers develop their technic so that they can distinguish between solid tumors and exudates, which would furnish a means of diagnosis in these cases. Dr. Wood has failed in a large number of these cases to make a diagnosis. It is very puzzling when the tumor is covered with exudate, with the usual clinical signs absent.

Dr. W. H. Peck referred to a case of melanosarcoma with minus tension that he exhibited last spring. He removed the eye six weeks ago. The tumor has assumed large proportions. Transillumination also failed in this case to make a diagnosis. Dr. Peck stated that differentiations of tumors from exudates by means of the x-ray would be rather difficult on account of the ethmoid bones, which offered so great an obstacle to the ray that any fleshy tumor would not be visible in the skiagraph.

Dr. Geo. F. Suker has found it advantageous in using transillumination to have the room dark and to use a little tube like

opticians use and an electro-ophthalmoscope and have the trans-illuminator posteriorly. It makes considerable difference, and one gets a better view and is better able to differentiate between tumor and exudate. It gives a perspective not obtained otherwise. As to the skiagraph, he believes that the only thing to do is to take a stereoscopic view, taking pictures from different sides.

Dr. Wood suggested that the position of the tumor might make it impossible to use transillumination, although it would not be of much service in masses situated behind the equator of the globe. It is only those obstructions existing in the anterior of the eye that can furnish any evidence of their existence. When they occur in the neighborhood of the nerve head not much evidence can be expected from any kind of trans-illumination.

Ocular Paralysis.

Dr. H. B. Young, Burlington, Iowa, reported a case of ocular paralysis following a football accident. Following a blow on the eye from another man's head, the force of the blow impinging on the malar bone, the boy became unconscious and after arriving home he vomited. There was much swelling and ecchymosis, but the physician in attendance did not find any evidence of fracture of the bone. When the eye was opened the following morning, the boy found that he had diplopia. The condition has changed but little since that time. The swelling has quieted down, and in the median horizontal plane there is no diplopia, but only on looking up or down. There is a manifest lack of upward and downward motion; the muscles affected are evidently the superior and inferior recti. It undoubtedly was not a case of intracranial injury because the whole third nerve would have been involved, with ptosis, divergent squint and dilated pupil, but lateral motion is perfect.

DISCUSSION: Dr. Brown Pusey stated that he had seen horizontal paralysis of inferior and superior rectus muscles in both eyes.

Dr. Thos. Faith has seen three cases in which there was paralysis of the internus, superior and inferior muscles, leaving both obliques intact and accommodation normal. These cases were not of traumatic origin. Dr. Patrick thought that the location of the nuclei of the individual fibers of the nerve were so distributed along the floor of the fourth ventricle that only two or three roots could be involved and the others remained free.

Optic Neuritis of Intraocular Origin.

Dr. Henry Gradle, Chicago, in this paper referred to the pathogenesis of one-sided optic neuritis due to the extension of choroidal inflammation, dwelling especially upon that form which he had previously described as transient circumscribed central chororetinitis. The lesion is a single choroiditic patch more or less centrally located, of variable size, ending in partial choroidal atrophy, and leaving ultimately a circumscribed scotoma. There are always some vitreous opacities and deposits on Descemet's membrane during the active period of the disease, which is very often accompanied by optic neuritis. When the choroidal patch is very small, and especially when such a small patch is located close to the edge of the disc, the optic neuritis may appear at first to be the primary disease. But on observing vitreous opacity, deposits on Descemet's membrane, and ultimately the pigmentary changes in the choroid, it becomes evident that the neuritis is but secondary to the choroidal inflammation. This form of choroiditis is presumably due to the entrance of infectious material into a posterior ciliary artery. Treatment by salicylates and iodid did not seem to influence the course of the disease, while cathartic doses of calomel were apparently of benefit. The writer also called attention to the occurrence of optic neuritis in the course of other forms of choroiditis.

MORTIMER FRANK,

Secretary.

ST. LOUIS MEDICAL SOCIETY: OPHTHALMIC SECTION.

The Chairman, DR. BARCK, *Presiding*.

A Case of Migrating Keratitis.

By Dr. J. Ellis Jennings. This patient is 23 years of age with evidences of congenital syphilis, Hutchinson's teeth, etc. In 1897, at the age of 13, she developed an interstitial keratitis in the left eye which slowly cleared. Final V—5/5; right eye, V—5/1. In January, 1906. She developed a serious iridocyclitis in the left eye which reduced vision to 5/40. This eye still flushes upon the slightest provocation. On February 1, 1907, she complained that the vision of the right eye was failing, V—5/40. Examination showed an infiltration in the deeper layers of the cornea, consisting of several opaque dots surrounded by a hazy area, with absolutely no signs of inflammation, pericorneal injeec-

tion or bloodvessels in the cornea. The opacity started at the nasal side of the pupil and had gradually crossed to the temporal side, so that vision which was reduced to 5/40 is now 5/6, the opacity taking four months in transit.

DISCUSSION: Dr. Alt stated that the case seemed to him particularly remarkable on account of the long interval between the affection of the one eye and that of the other.

Dr. Barck believed the case to be a keratitis due to hereditary syphilis, and stated that the affection in the second eye was apt to pursue a milder course than that in the first, on account of the specific treatment which had been given at the time the first eye was affected.

Dr. Jennings stated that the peculiarity in the case consisted in the migration of the opacity across the cornea without inflammatory signs. Treatment had been confined to the use of dionin daily.

Rupture of Descemet's Membrane from High Intra-Ocular Pressure.

By Dr. A. Alt. Fissures in Descemet's membrane have been found especially in buphthalmus, high grade myopia and glioma retinal. Some observers appear to have encountered these fissures frequently and others not at all. The author believes that high pressure alone cannot be held responsible, but that other factors, such as the softer tissue of the child (in examples occurring in glioma) and disturbances in the nutrition of the corneal tissue, are to be held accountable.

Recently in a case of glioma, the author observed two double contoured gray lines running in the deeper layers of the cornea concentrically with the corneal periphery, the one 2 mm. from the temporal, the other 3 mm. from the nasal margin. Sections showed the ruptured ends of Descemet's membrane rolled up spirally towards the cornea or projected straight into the anterior chamber. The close packing of the overlying corneal lamellæ and their straightened appearance suggested that at the time the ruptures occurred the cornea was also torn to some extent. That the ruptures were not very recent was proved by the fact that the ruptured ends were covered with endothelium, and that a new Descemet's membrane had formed in the gap between the ends, which were also covered by a layer of endothelium. Opposite these ruptures Bowman's layer was wanting for some distance, the corneal tissue being simply covered with epithelium.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting November 19, 1907.

DR. HOWARD F. HANSEL, Chairman, Presiding.

Argyrosis due to Argyrol.

Dr. Frederick Krauss reported a *Case of Argyrosis due to the Use of Argyrol*, and exhibited the patient, a child, aged four years, who had been under treatment for dacryocystitis. Without the knowledge of the attending physician, the parents had instilled one drop of a 20 per cent solution of argyrol into the conjunctival cul-de-sac of the right eye for a period of twenty months. The coloration was deepest in the lower fornix and on the caruncle, and diminished rapidly upon the withdrawal of the drug and the administration of potassium iodide.

Dr. Pyle said that in reply to an inquiry the manufacturers of argyrol stated that the argyrosis was rare and of short duration, and would usually disappear completely by the use internally and locally of sodium iodide. In cases which follow the injection of solutions of argyrol into the cellular tissues after false passages of lachrymal probes, weak solutions of sodium iodide should be injected through the canaliculus.

Dr. Hansell said the manufacturers insisted that the drug should be freshly prepared, and he thought, as it was so extensively used at present, many other cases would be seen, unless these directions were carried out. Dr. Ziegler said it was claimed by the manufacturers that solutions more than two weeks old should not be used, and that the rare cases in which bad results were obtained were due to the use of old solutions. He had seen one case which showed slight staining from prolonged use of the drug.

Keratitis Profunda.

Dr. Krauss exhibited also a *Case of Keratitis Profunda* occurring in a girl, aged seven years, who had no history of syphilis, rheumatism, malaria, or traumatism. Vaccination had been performed four weeks previous without producing any untoward symptoms. The case was particularly interesting because, aside from its rarity, Fuchs states that the disease occurs only in adults. The opacity in the left eye was disciform, and situated in the deeper layers of the cornea, with numerous spots of denser opacity, most marked in its periphery. In the right eye it consisted of four distinct areas, arranged in a crescentic form across the cornea. When viewed with high power, these areas were found to consist

of a fine stippling placed just in front of Descemet's membrane. The course of the disease was chronic, inflammatory symptoms and new vessel formation being absent.

The Ocular Symptoms of Chronic Polycythemia.

Dr. G. E. de Schweinitz described the clinical history and ophthalmoscopic appearances of a patient with chronic polycythemia and splenomegaly under the care of Dr. Alfred Stengel in the medical wards of the University Hospital. The disease had begun seven years ago with hemorrhagic diarrhea, and the patient was markedly cyanotic, especially his hands and face. The red blood cells varied from 11,000,000, the highest count, to 7,500,000, the lowest count, and the percentage of hemoglobin from 100+ to 140. The patient's vision, visual field, pupillary movements, and external ocular muscles were normal in all respects. The entire fundus of each eye was darker tinted than normal. The arteries were unchanged, the disk slightly redder than natural, and the veins greatly enlarged, being two or three times their normal caliber, and somewhat uneven and markedly tortuous. Their dark purplish color and tortuous course presented a striking ophthalmoscopic picture. Retinal hemorrhages and extravasations were lacking.

The retinal veins in Dr. de Schweinitz's patient were similar in appearance to those which have been depicted by Unthoff and Jackson, and the fundus differed from that of Jackson's patient in the absence of retinal hemorrhages and the alteration in the disk which the distended vein had produced. Dr. de Schweinitz contrasted the ophthalmoscopic appearances of chronic cyanotic polycythemia and cyanosis retinae, pointing out the differences between the two manifestations.

Double Perforation of the Eyeball by Metallic Foreign Bodies.

Dr. E. A. Shumway read a paper upon this subject, and reported a case of injury to the eye by a piece of soft iron. It was thought from the first x-ray examination that the foreign body was inside the eye, but the attempt at extraction failed, and, as later examination showed it to be outside the sclera, the eye was treated in the usual manner with iced compresses, atropine, and dionin, large doses of salicylates being administered. Twelve days after the injury the eye had quieted, but was slightly more prominent than its fellow, and the patient was discharged from the hospital. Two days later symptoms of intense meningeal irritation appeared, violent iridocyclitis developed, and more careful x-ray localization showed the body in contact with the sclera.

posteriorly and lying upon the optic nerve. As the eye was entirely blind, it was enucleated and the foreign body secured. All meningeal symptoms disappeared, and the recovery was uneventful. Dr. Shumway called attention to the infrequency of double perforations when the injury was not due to powder or dynamite explosions, only about fifty cases occurring in ophthalmic literature. He said that when the foreign body was embedded in the orbit at a distance from the eye, the prognosis was usually favorable, and such cases should not be operated on if there was no infection. When the body remained partly in the sclera, or just outside the sclera, statistics showed the necessity of removal of the body. If outside the eyeball, the route through Tenon's cavity, after section of one of the rectus muscles, should be chosen. If the foreign body could not be secured and iridocyclitis persisted, or if meningeal symptoms arose, the eyeball should be promptly enucleated. Dr. Shumway spoke also of several reported cases in which the Krönlein operation had been performed for orbital foreign bodies, and thought the method might be available if visual acuity was good and the patient demanded removal of a foreign body situated deep in the orbit.

Dr. Sweet showed a shrunken eyeball that he had enucleated which contained a foreign body partly protruding from the sclera posteriorly. The case was additional to the list in the paper presented at the meeting of the American Ophthalmological Society in 1907, in which he had reported 22 cases of double perforation.

Dr. de Schweinitz referred briefly to a case in which a foreign body 12 mm. long had been localized back of the eyeball, but two attempts at removal by the route through the space of Tenon had been unsuccessful. No wound of entrance could be found, but ophthalmoscopic examination showed a mass of exudate and detachment of the retina in the upper outer part of the eyeground, anteriorly. The iris was becoming discolored, in a way often characteristic of siderosis, and the body might be partly within the eyeball. No response has been obtained by the magnet at the time of operation, nor could the body be felt by a strabismus hook, although it was introduced into the orbit evidently through a rent in the capsule posteriorly.

Dr. Ziegler had seen a number of cases of double perforation in recent years. In one, a piece of a dynamite cartridge had been removed from the eyeball, and a second piece was localized in the orbit back of the eye. This was allowed to remain, and had caused no trouble. He had had the same experience with other

foreign bodies lodging in the orbit, and thought they should not be interfered with. In one case the foreign body was localized in the sclera, and unsuccessful attempts were made to secure it both through the eyeball and through the space of Tenon. The eyeball was afterward enucleated by Dr. de Schweinitz, and the steel was found within the eye. He thought the manipulation of the magnet might have dislodged it from the sclera.

Dr. Sweet referred to the difficulties of localization made possible by variations in the size of the eyeball, and to possible errors in calculation. In the case mentioned by Dr. Ziegler the steel was localized as protruding partially through the posterior scleral wall, and he thought it might have been drawn entirely within the globe by the strong magnetic pull. Dr. de Schweinitz said that careful serial sections of the eyeball by Dr. Hosmer proved that the sclera had not been perforated posteriorly.

Observations on the Motais Operation for Ptoxis. Reports of Three Cases.

Dr. Wm. T. Shoemaker analyzed the mechanism of the Motais operation, and concluded that the ptosed lid was held in its position by *fixed anchorage* to the eyeball at a point corresponding to the insertion of the superior rectus before interference. That the superior rectus was made to supply a perfect physiological substitute for the deficient levator, as commonly supposed, was, he thought, not the case, but contended that after the Motais operation there could be no movement of the lid through the superior rectus, independent of the eyeball, to which the upper portion of the lid becomes firmly attached.

The tendon slip from the superior rectus was inextensible and could not be carried into the lid, but the upper margin of the tarsus must be crowded into the recess made by the lifted middle third of the rectus tendon. One cause of failure was the transplantation of the prepared tendon slip into or among the fibers of the obicularis muscle, in which case the result was apt to be uncertain on account of slipping of these fibers over the tarsus, and an ineffectual influence on the tarsus itself, which must be raised in every successful ptosis operation.

Another cause of failure was the improper preparation of the tendon slip from the superior rectus. This, Dr. Shoemaker thought, should not include the muscle fibers, but should be limited to the tendon. Should the muscle fibers be included, the slip was apt to part upon the slightest tension.

To facilitate the direct application of the rectus tendon to

the tarsus, he advocated an open operation. To this part of the operation, or that of preparing the tendon for transplantation, was as in the original Motais. The second half of the operation consisted in making a horizontal incision through the skin of the lid and the orbicularis fibers down to the tarsus, which, together with the tendon attachments of the levator muscle, was exposed by pushing upward or backward the overlying tissues. Müller's muscle was buttonholed, and through the opening the threads, with the attached piece of rectus tendon, were drawn, and the tip of the tendon slip was attached directly to the edge or upper margin of the tarsus, precisely as the tendon is stitched to the sclera in an ordinary advancement. After dipping into the tarsus, the needles were carried through the obicularis fibers and skin, and tied.

A further modification of the application of the Motais principle to a different procedure, as devised by Cannas, was advocated. Cannas sought to stitch with catgut the belly of the levator to that of the superior rectus. Shoemaker believed such an operation uncertain, and recommended stitching the *tendon* of the levator at the upper margin of the tarsus to the *tendon* of the rectus. The technique was simple, and in effect the result should be identical with that of the original Motais operation. The superior rectus tendon was raised on a hook and the upper margin of the tarsus was exposed, as in the open operation above alluded to. A double armed thread was passed through the rectus tendon and then through the levator tendon attachment at the margin of the tarsus. These two points were then drawn into firm apposition. The needles were carried through to the skin surface, where the threads were tied.

The superior rectus being present, and the eyeball not being in permanent downward rotation, the only contra-indication to a Motais operation in its original or modified forms was a poorly developed muscle tendon. If such a tendon was found, the operation would better be abandoned.

Regarding this operation as one of fixed anchorage to the eyeball only, Shoemaker did not consider paralysis of the superior rectus a necessary contra-indication, and saw no reason why, in such a case, provided the eyeball was not deviated downward, thus lowering and rendering inefficient the point of support for the lid, the whole tendon even should not be transplanted into the lid and put to some use. The inferior oblique would supply counter force as well as some upward movements of the eyeball.

The three cases were all operated under general anesthesia. They were unilateral congenital ptosis, two partial and one almost complete. In the case of complete ptosis about one-half elevation was obtained. One case was a total failure, because the rectus tendon slip included muscle fibers and promptly parted. The third case gave a very satisfactory result.

Dr. Posey said that he had never done the Motaïs operation, as he thought the traction which the lid would exert upon the globe would be undesirable. He called attention to the asthenopia which symblepharon and even swollen lids may occasion by pressure on the eye and by limitation of its movements. In any event, the Motaïs operation would not be applicable to many cases of congenital ptosis, for, as is well known, the superior rectus muscle is often at fault in these cases, as well as the levator. He had usually performed the Panas operation himself, but recently had employed the Hunt-Tansley modification, as he had found that the original procedure did not always exert sufficient effect. He exhibited a child with marked congenital ptosis, upon whom a Hunt-Tansley operation had been done six weeks previously. The lid was in good position and there was but little disfigurement.

Dr. de Schweinitz said that he himself had not performed the Motaïs operation for the relief of ptosis, and, therefore, could add nothing to the discussion from that standpoint, but congratulated Dr. Shoemaker on the clearness with which he had explained the steps of the operation and the modifications which he had suggested. Dr. de Schweinitz in his ptosis operations had confined himself to various modifications of stitch operations, Panas' operation, and the so-called Hunt-Tansley operation, and with the last named procedure had satisfactory results in practically all cases, save only that, at least in the early days after the operation, there was a tendency to be a failure in the correlation of the movements of the eyelid and the downward rotation of the eyeball, very much as this occurs in exophthalmic goitre. He believed, however, that this was a comparatively temporary fault, although one which must be regarded. Photographs were exhibited showing the results of the Hunt-Tansley operation, as well as a photograph of a patient with ptosis and complete paralysis of the superior rectus muscle of congenital origin, representing a condition, he presumed, suited to the modification of the Motaïs operation which Dr. Shoemaker had suggested, provided the fault was dependent upon an imperfect development of the superior rectus, and not upon imperfect innervation. On this point he hoped to hear further from Dr. Shoemaker.

Dr. Sweet showed a patient on whom he had done the Hunt-Tansley operation on both eyes. The case was further interesting having complete external ophthalmoplegia in both eyes. He referred also to 2 cases of monocular ptosis, in which he had secured good results by the same operation.

Dr. Shoemaker, in closing, said that the Motais operation had not been popular in this country, and not many cases had been reported. There might be some dragging pain from the attachment of the eyelid to the eyeball, but in the two cases recorded he had found no such complaint. He thought that Dr. de Schweinitz's patient might be an excellent one to try the operation upon.

Rhythmical Movements of Eyelids.

Dr. C. A. Veasey reported a case of *Rhythmical Alterations in the Width of the Palpebral Fissure of Both Eyes, Probably Produced by Spasm of the Levator Palpebrae Muscles* occurring in a boy aged seven and one-half years, both of whose parents were more or less nervous. The child himself had always been nervous and quick in his movements. For several months there had been observed an upward movement of both upper lids, occurring about twenty times in a minute and sufficiently great in extent to uncover the cornea and expose the sclera above. The movements were much more marked at times than at others, but were especially bad when something occurred to make the child nervous. The movements were rhythmical in character and were believed to be due to contraction of the levator muscles. The frontalis was not involved, nor were there any changes in the pupils. The patient had a moderate hyperopic astigmatism, which was corrected under atropine, and the glasses ordered to be worn constantly. This gave considerable relief, but the movements did not entirely cease until the patient was placed upon ascending doses of Fowler's solution of arsenic.

Dr. Pyle said he had seen similar rhythmical movements of the eyelids in a brother and sister, and correction of the compound hyperopic astigmatism had stopped the movements. In these cases the movements were evidently due to eyestrain, as no internal medication had been found necessary.

Simple Glaucoma in the Young.

Dr. C. A. Veasey also made a *Supplemental Report of a Case of Simple Glaucoma in the Young*. In conjunction with Dr. Shumway he had reported the case before the section in December, 1903. The patient was a young colored woman, who at sixteen years of age began to notice failure of the vision in the right

eye, after an attack of typhoid fever. At no time had there been pain, but the eye became gradually blind, despite treatment during the course of three years, and then severe attacks of pain became so frequent that enucleation was performed. Microscopical examination had showed deep excavation of the optic nerve, an unusually large lens, and pigmentation in the tissues about the angle of the anterior chamber.

Six months ago, three and one-half years after reporting the case and seventeen years from the appearance of glaucoma in the first eye, the patient presented herself complaining of dim vision in the remaining eye, when ophthalmoscopic examination showed a beginning glaucomatous cup, the vessels being crowded to one side and the visual field considerably contracted. The tension was slightly elevated. Myotics were faithfully employed locally and strychnine and nitroglycerin internally, but in spite of this the cup of the optic nerve became more and more extensive and the field of vision more and more contracted. When it was found, after some weeks, that the myotics in gradually increasing strengths did not check the advance of the glaucoma, iridectomy was proposed and declined. Six months have now elapsed, the patient having always declined operative procedure whenever such was proposed, and although the myotic treatment, together with optic nerve stimulants, had been carefully and faithfully employed, the patient was now almost totally blind, there remaining but a small amount of eccentric vision and the field being contracted to a very small area. Dr. Pyle said he had seen a case of chronic glaucoma in a child fifteen years of age at one of the Will's Hospital clinics.

Dr. Posey said that he thought it probable that Dr. Veasey's case had some underlying cause, such as syphilis, as he did not believe an ordinary case of chronic simple glaucoma would lose so much field and visual acuity in six months, and that, therefore, one could draw no deductions from it regarding the value of the myotic treatment of chronic glaucoma. He added, too, that juvenile glaucoma must be a rare affection, as in the group of 164 cases of chronic glaucoma collected by Dr. Zentmayer himself some years ago, but one case occurred in a subject under twenty-five years of age.

* Dr. Turner said he thought Dr. Veasey's patient had complained of failing vision in the second eye for eighteen months before she became blind. Dr. Veasey replied that she had complained of metamorphopsia and photopsia ever since he had known her, and he had studied the case for a long time with the idea

of ascertaining whether there was any connection between these conditions and the appearance of glaucoma simplex, but there was no sign of cupping of the nerve and impaired vision until the examination six months before writing the notes, when the patient said she had first noticed failing vision three months before. No examination had been made for some months previous, and vision may have been failing for some months before she observed it. He had not gone into the literature of the subject at this time, but the comparative rarity of the cases was shown in his previous paper, when less than three dozen reports of cases were found in the literature.

A Comparison Between Simulated and Hysterical Blindness.

Dr. Howard F. Hansell briefly described the usual text-book symptoms of hysteria and the common tests for simulation, and called attention to the dissimilarity of the two affections. Cases arise, however, in which difficulty in the diagnosis is encountered, and a decision must be made and supported by the strongest evidence, in order to prevent injustice and lead to a proper line of treatment. Such a case was the following: A man received a superficial corneal wound from a fine fragment of glass while riding in a car. The corneal wound had entirely recovered, with the restoration of the transparency and curvature of the cornea in two or three weeks. At this time he claimed to be blind in the injured eye. The pupil reacted to light and convergence. The media were clear and the fundus was healthy. Binocular vision was demonstrated by deviation of the right eye, the one said to be blind, in overcoming prisms (Jackson's test) and in reading uninterruptedly when a pencil was held in front of the eye (Weiland's test). Subsequently the man suffered from dysentery, rectal fistula, and appendicitis, said by the medical experts for the plaintiff to have been caused by infection of the corneal wound, notwithstanding the admission that the eye had perfectly recovered in three weeks without corneal scar. Dr. Hansell questioned (1) whether the eye could have been infected; (2) whether the other structure of the eye would not have shown some signs of involvement had the cornea been infected; (3) could the bloody diarrhea, rectal fistula, and appendicitis be the result of the accident to the eye; and (4) was the blindness hysterical or simulated. Two groups of medical experts testified in court under oath, the one that the long train of disasters was traceable to infection following the accident, the other was that it was not. In view of this con-

flict of opinions, the thought is suggested that medical expert testimony might better be eliminated in suits for damages for personal injuries. In the usual jury trials scientific knowledge seems to carry little weight, the verdict depending rather upon relative cleverness of the opposing attorneys in making their appeals to a sympathetic jury and emphasizing with pathetic tenderness the contrast between the "poor man" and the "rich corporation."

Dr. Sweet said he had examined the case referred to by Dr. Hansell, but was not a witness at the trial. The tests had shown that the man was able to read with the eye that he claimed was blind, but he did not believe that this fact proved the case to be one of simulation. He considered the condition traumatic neurosis, and the man evidently believed he could not see. There was complete hemianesthesia, and, while he did not think infection had been the actual cause of blindness, he thought the man was not a malingerer.

Dr. Posey spoke of the difficulty there is in giving impartial testimony in cases of so-called "traumatic neurosis," and cited the instance of a man and wife who had been severely injured in a railroad accident a year previously. The head and eyes had not been involved in the accident, but ever since reading or any prolonged use of the eyes had been attended with great pain. Both patients had high refraction errors, but corrected vision was normal and there was a good range of accommodation in both eyes, and the fields were unaffected. The ophthalmoscopic examination was negative. With these negative findings, one might impute the symptoms to malingering, yet this might be most unjust to the patients, who might be actually suffering from neurasthenic asthenopia as a consequence of shock.

Dr. de Schweinitz thought that patients with hysterical blindness might be divided into three classes: Those who simulate the blindness, those who see unconsciously but are not capable of conscious vision, and those who really are transiently blind. It must be remembered that because hysterics apparently blind in one eye, that is, unconscious of its visual acts, may be proved to see with this eye by tests for the detection of malingerers, they are not necessarily malingering. As Pitres puts it, the uniformity of the answers given by the subjects of unilateral hysterical blindness is not reconcilable with the theory of deception in the ordinary acceptance of this term. The blind hysteric is consistent; the patient who pretends to be blind, but is not hysterical, is not consistent. In a sentence, the patient with unilateral hysterical

amaurosis who is proved by ordinary tests to see with the supposedly blind eye is not thereby convicted of malingering.

Those hysterics who simulate the blindness are not malingerers in the ordinary sense of the term, but their simulation is part of the symptom-complex of their hysteria. They differ from those who, without other hysterical manifestations, deliberately simulate blindness, themselves being sound, for the purpose of gain, or to escape the duties of army service, etc.

Referring to that portion of Dr. Hansell's paper which had to do with the inconsistencies of expert medical testimony at the present time, he entirely agreed with him that such testimony would better be eliminated from the consideration of traumatic cases, unless suitable laws were enacted which should properly regulate not only the method of employing experts, but, just as well, the method by which these experts are frequently handled, or, more properly, mishandled, by the attorneys who are trying the case. Of one thing he was convinced, namely, that the subjects of traumatic neurosis, or traumatic hysteria, whatever the particular manifestation might be, were entitled to the fullest consideration, both from the legal and from the medical standpoint, as careful examination would frequently show that, in spite of their exaggerations, they were none the less within proper limits (and it was exactly these limits that ought to be determined by suitable medical examination), as ill as if their symptoms represented the interpretations of a demonstrable organic lesion.

Dr. Pyle thought Dr. Posey and Dr. de Schweinitz had done well to call attention to the possibility of injustice to the plaintiffs in these cases. It must be borne in mind that although often their statements were plainly exaggerations, they were not malingerers, but the victims of profound neurasthenia or hysteria. In regard to the question of medical expert testimony, he believed that the best results would follow the appointment, by the court, of an impartial board of medical experts or referees, whose duties would include the elucidation of all doubtful technical questions referred by the judge, jury, or attorneys.

Ocular Manifestations of Tertiary Syphilis.

Drs. William Campbell Posey and Frederick Krauss showed three colored women, all of whom presented ocular manifestations of tertiary syphilis.

CASE I, aged forty-two years, exhibited a very marked degree of syphilitic disease of the retinal vessels, with optic atrophy. Vision was much reduced in each eye. The arteries were reduced

to mere threads and were covered in places with a grayish white opacity, which gave them the appearance of silver wires. The veins also showed signs of vasculitis. There were remnants of hemorrhages in the macular region. The authors referred to a degree of similarity with a case of perivasculitis recently reported by de Schweinitz, though the nasopharynx in the case under discussion was free from disease.

CASE II was one of cerebrospinal syphilis, with complete palsy of left oculomotor and trochlearis nerves, in whom the ocular symptoms rapidly disappeared under anti-syphilitic treatment.

CASE III.—There was complete palsy of the third nerve in this case, the chief interest centering in the sudden and complete disappearance of head pain which had been present for months, with the onset of the palsy, the transference of the symptoms from the occiput to the eye being in apparent connection.

The authors said that isolated palsy of the eye muscles is not infrequently the first symptom of syphilis. Probably at least half of the cases of ocular paralysis are due directly to syphilis and occur in the latter stages of the disease. Knies' figures were quoted, which indicate that the motor oculi are affected in about three-fourths of the cases, the abducens in one-fourth, the trochlearis and facial in 1 or 2 per cent. Syphilitic palsy is not so apt to be transitory or limited to single muscles as tabic paralysis.

The authors quoted Naunyn's figures, who had observed 20 per cent of recoveries, and stated that his observation that there is no hope of recovery if evidences of improvement do not appear after vigorous treatment for two weeks indicates the correctness of Callan's assumption that we too often needlessly postpone operative interference in such cases.

Operation for Ectropion.

Dr. Posey showed also a case of ectropion of the upper lid, which had been corrected by a Wharton-Jones sliding flap operation, in conjunction with an external canthoplasty. Healing had been uncomplicated, notwithstanding the necrotic condition of the tissues operated upon, the deformity having been occasioned by a dynamite explosion and the entire face badly scarred. Dr. Posey praised the Wharton-Jones procedure, dwelling particularly upon the excellent nourishment of the flap.

EDWARD A. SHUMWAY, M.D.,
Clerk of Section.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. Phinizy Calhoun of Atlanta, Ga., has returned from his European trip.

Dr. H. Manning Fish and Dr. Oliver Tydings were recently elected to the Chicago Ophthalmological Society.

Dr. J. Hobart Egbert has been elected on the staff of St. Joseph's Hospital, Willimantic, Conn., for eye and ear.

Dr. William M. Sweet of Philadelphia has been elected a director of the Aid Society of the Philadelphia County Medical Society.

The Massachusetts Eye and Ear Infirmary is a beneficiary to the amount of \$10,000 in the will of the late Miss Florence Lyman of Boston.

Dr. Louise Paine Tingley has been appointed ophthalmic surgeon to the New England Hospital for Women and Children, Boston, Mass.

The Boston Nursery for Blind Children has received a bequest of \$3,000 from the will of the late Marian T. Whitney of Saugus, Mass.

Dr. M. Ohlemann of the staff of the *Wochenschrift für Therapie Und Hygiene des Auges*, has removed from Dessau to Wiesbaden, Germany.

Dr. Francis M. Chisholm has been recently appointed Associate Professor of Ophthalmology in the Medical School of the University of Maryland.

Dr. F. E. Wallace, formerly of Monmouth, Ill., has moved to Pueblo, Colo., where he will take up his special work in eye, ear, nose and throat diseases.

Dr. Geo. H. Sheldon, who was formerly oculist to the St. Louis City Hospital, died recently at his home in St. Louis, of heart disease, at the age of 33 years.

In Baltimore in October, 1907, 9,295 children were examined in the public schools and 4,149 were found physically defective, and of these 618 had defective vision.

Dr. Jas. A. Young has recently returned to his practice in San Francisco from his Eastern and oriental tour of study in his specialty of eye, ear, nose and throat.

Dr. Francis M. Chisholm has resigned from the staff of the Presbyterian Eye, Ear and Throat Charity Hospital, and is no longer connected with that institution.

At a meeting of the Ninth Councilor District, Indiana State Medical Association, held November 21st, 1907, at Labanon, Ind., Dr. Geo. F. Keiper of Lafayette, Ind., was elected secretary.

Dr. Francis M. Chisholm and Dr. John R. Winslow are now associated in the private practice of eye, ear, nose and throat in Washington, D. C., with offices in "The Champlain," 1424 K street, N. W.

The Howard Hospital of Philadelphia reports that in October sixty-four patients were admitted to the hospital wards, 648 were treated in the out-patient department, and 205 in the accident department.

Dr. Moritz Wolfrum, assistant to Prof. Dr. Sattler in the University Eye Clinic at Leipzig, has qualified as instructor in ophthalmology with the essay entitled "Regarding the Inner Musculature of the Human Eye."

A Section of Ophthalmology and Oto-Laryngology has been formed in the Toronto Academy of Medicine. The officers are: Dr. G. Sterling Ryerson, Chairman; Dr. Price Brown, Editor; and Dr. Colin Campbell, Secretary.

The corporation counsel of Chicago has refused a permit to the Chicago Eye, Ear, Nose and Throat College to erect a twelve story building on their present site at Washington and Franklin streets. Hospitals are limited by law to a height of six stories.

Among the faculty changes at the Baltimore Medical College are the appointment of Dr. J. Frank Crouch as professor of materia medica and diseases of the eye and ear to succeed Dr. Geo. Reuling, and the appointment of Dr. Clyde A. Clapp as lecturer on diseases of the eye and ear.

The Eleventh Annual meeting of the stockholders of the Chicago Eye, Ear, Nose and Throat College was held December 1, 1907. The reports of the officers showed a healthy growth over the gradual increase of former years and a very satisfactory condition of the institution in all departments. The former board of directors, consisting of Drs. W. A. Fisher, A. G. Wipperfurth, H. W. Woodruff, Thomas Faith and J. R. Hoffman, was re-elected for the ensuing year.

In the *Medical Record*, June 22, 1907, is an article urging the necessity of paid missionary oculists who shall have headquarters in a small country town and from there make regular excursions along the lines of the rural free delivery for the purpose of correcting the refractive errors of those who cannot go to the cities to consult specialists. This field is now held by the quack peddler, and it seems doubtful if it will be possible to find the competent specialists of which the *Record* speaks to undertake this work.

Dr. Oliver Wendell Holmes, in a letter to Mrs. Priestley, one of his English friends, wrote: "It is now some years since I gave up using the microscope, having found by the *reflection from my lenses* that there was an opacity somewhere in the field of vision of my working eye." In December, 1887, the irresistible tendency of his youth for the making of puns reasserted itself in the following sentence in another letter to the same lady: "My eyes are getting dreadfully dim and I should hardly know your beautiful face across the street. One of them has, I fear, though I don't quite know, a *cataract* in the *kitten* state of development."

Life and Letters of Oliver Wendell Holmes. J. T. Morse, Jr.

A London, England, oculist is given credit for the statement that if he had his way he would paint all London green in the interest of tired eyes and nervous systems. If green paint will brighten London and make it happy, let them by all means have it spread on. Perhaps it will neutralize some of their everlasting fogs and dreary rainy days.

Dr. Howard Hansell of Philadelphia has written a biographic sketch of the late William Thomson, M. D. Dr. Thomson died August 3, 1907, from uremic poisoning. He continued the care of his private practice until his death. He was born in Chambersburg, Pa., on January 28th, 1833, and his family is closely connected with the history of the development of Pennsylvania. Between 1861 and 1868 Dr. Thomson served on the medical corps of the Union Army, where his ability brought him rapid promotion, ending in his being appointed superintendent of all the Washington Military Hospitals. After leaving the army service he took up the practice of ophthalmology in Philadelphia. He was one of the pioneers who made ophthalmology recognized as a special branch of medicine. In 1873 he was elected Lecturer on Diseases of the Eye and Ear at Jefferson College and in 1880 was advanced to the grade of Honorary Professor of Ophthalmology. His best known literary works are: "Diseases and Injuries of the Eye," in Gross' System of Surgery; "Surgery of the Eye," in the American Text-Book on Surgery; "Normal Color Perception and the Detection of Color-Blindness," in the American System of Diseases of the Eye; the appendix to Nettleship's work on Diseases of the Eye, on "Color Blindness and Its Detection."

Dr. Thomson was a man of great personal magnetism and was known and loved in a way that is given to few men. His death is universally mourned.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|--|--|--|---|--|--|
| 9 A.M. | Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E., N. T.) | G. W. Mahoney (Poli.) *Geo. F. Suker (P.-G.) | J. Elliot Colburn (E. E., N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E., N. T.) | Richard S. Pattillo (P.-G.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E., N. T.) | J. R. Hoffmann (E. E., N. T.) | E. J. Brown (E. E., N. T.) | Oliver Tydings (E. E., N. T.) | J. R. Hoffmann (E. E., N. T.) | J. R. Hoffmann (E. E., N. T.) |
| 11 A.M. | | A. G. Wipperfurth (E. E., N. T.) | | A. G. Wipperfurth (E. E., N. T.) | | A. G. Wipperfurth (E. E., N. T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. Le. Brown (Inf.) E. J. Gardner (E.E.N.T.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Wilder (Rush) N. A. Young (Inf.) C. G. Darling (N.W.U.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. F. Horwitz (N.W.U.) Francis Lane (Rush) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) | E. V. Le. Brown (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Frank Allport (St. Luke's) *Frank Brawley (St. Luke's) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) | E. V. Le. Brown (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. H. Wilder (Rush) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | H. B. Brown (Ills. Med.) | J. E. Harper (P. & S.) *Wm. E. Gamble (P. & S.) | Burton Hazeltine (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.-G.) |
| 4 P.M. | W. F. Coleman (P.-G.) | C. W. Hawley (P.-G.) | G. F. Suker (P.-G.) | C. W. Hawley (P.-G.) | W. F. Coleman (P.-G.) | Brown Pusey (County) |

*Special operative eye clinics.

ABBREVIATIONS:

| | | | |
|---|---|--|--|
| C. C. S., Chicago Clinical School, 119 W. Harrison Street. E. E. N. T., Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | County: Cook County Hospital, W. Harrison and Monroe Streets, Ills. Med.; Illinois Medical College, 182 Washington Blvd. Inf.; Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets, 2431 Dearborn Street. | Poli.: Chicago Policlinic and Hospi- tal, 174 E. Chicago Avenue. P.-G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. N. W. U.: Northwestern University, 2431 Dearborn Street. | Rush: Rush Medical College, W. Harrison and Wood Streets, St. Luke's Hospital, 1416 Indiana Avenue. |
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THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
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Original Articles

PROBABLE METASTATIC HYPERNEPHROMA OF THE CHOROID WITH MICROSCOPICAL FINDINGS.*

BY CHARLES P. SMALL, M. D.,

Instructor in Ophthalmology, Northwestern University Medical School.
(Illustrated.)

On account of the interesting developments of the case, this paper is presented in the same order, as nearly as possible, as it presented itself to me. The case is that of Mrs. M., 43 years old, who on the 4th day of October, 1907, presented the following symptoms: The left eye ball was highly inflamed, the entire conjunctival surface being deeply injected; both lids were somewhat swollen and the conjunctival surfaces much congested. The ciliary vessels were slightly injected. The pupil widely dilated and not responding to light stimulation. No synechiæ present. The lens opaque and of a pearly white color, with sectors of a more brilliant whiteness. There was a small pinguecula-like swelling on the conjunctiva to the nasal side of the cornea. The globe was exquisitely sensitive to slight pressure, especially over the ciliary region on the inner and upper sides. There was absolute loss of all light perception. Tension was minus two. The patient was suffering constant severe pain which confined itself wholly within the eye. The history of the case was as follows: Five weeks previous to this time, on August 30th, she was with some friends in a row-boat, and as they were passing under a bridge she looked up suddenly to speak to a person standing on the bridge. As she did so, something fell and struck the eye, as it seemed to her, with considerable force. It gave her severe pain, which continued for three days, even keeping her from sleep at night. During this time, however, the external appearance of the eye seemed practically normal. On the third day after it happened she received a great mental shock from the sudden death of her youngest son in a railroad accident. This caused her to cry excessively for several days, but on

*Read before the Chicago Ophthalmological Society, Dec. 9, 1907.

account of her distracted mental condition she says she really forgot about her eye, and does not recall that it was painful. But four days later, just a week from the time it happened, the pain returned with greater intensity than ever. She got no sleep that night, and the next morning the lids were so swollen the eye could not be opened. It remained in this condition



for about a week when the swelling gradually subsided. The pain had continued severe up to the present time. From this history, and the appearance of the organ at this time, the presence of a foreign body within the globe was rather strongly suspected. X-ray pictures were taken, but the plates showed nothing

conclusive. The Haab magnet was tried, but no reaction could be obtained. While under observation for the next few days, hot applications were used frequently, and a drop of a 5 per cent solution of dionin instilled into the conjunctival sac three times a day. An interesting feature is her subsequent statement that the pain stopped almost suddenly after the instillation of the first drop of the dionin solution and never returned to give her much annoyance. She was told in the first place that it would probably be necessary to have the eye removed on account of the danger to the other eye if it was allowed to remain. Her history of the foreign body striking the eye; her statement that she had never had any trouble with her eyes, never even having had the slightest pain in



either of them, especially the greatly lowered tension, and the slightly swollen and discolored spot on the conjunctiva which might be taken for an abrasion or cut which had healed, all together made it seem at least reasonable to believe there was a foreign body somewhere within the globe posterior to the iris, or that the globe was undergoing rapid degeneration from the consequences of the force of the traumatic injury. Vision was hopelessly destroyed. She consented to the operation, and I enucleated the eye on the following day. Perfect healing followed and she is now wearing comfortably an artificial eye. The specimen, after hardening, was cut through in the middle antero-posteriorly in the horizontal meridian, and a tumor was seen attached to the posterior surface of the choroid.

Bi-convex in shape, measuring nine by six mm. A central portion of a canary yellow color, measuring seven by three mm.

To appreciate the significance of the pathological findings we may note the essential points of her previous history. Forty-three years of age; has been married twenty-six years; has had three children, the oldest twenty-four, and the youngest nineteen. For many years she has done a great amount of fancy needle work, especially at night. For the past nine years has had for constant wear 1.50 diop. spheres in each eye. Her family history is negative, except that she states her maternal grandmother became blind three years before her death.

Following are the complete pathological findings:

Antero-posterior diameter of the globe is 23 mm.

Equatorial diameter, 21 mm.

Distance from anterior surface of tumor to posterior surface of lens, 6 mm.

The unstained section by the naked eye and loup shows the tumor consisting of cortex and medulla; the medulla of a canary yellow color. Two pigmented streaks in the temporal edge of the tumor are blood vessels cut length wise and surrounded by pigment. The choroid contains pigment to the ciliary processes, a fine pigment line going across from iris root to iris root. The surface of the tumor is pigmented on the temporal side; a little pigment on the nasal side at the junction of the tumor and the choroid. A fine pigmented line on the vitreal surface of the tumor. On the temporal side pigment extends under the tumor 2 mm.—over the optic disc. Bands in the vitreous show fine pigmented lines. The base of the tumor shows almost no pigment; it abuts the sclera. The sclera in two places posterior to the tumor shows some pigment.

Under high and low power, stained with haematoxylin and eosin, findings are as follows:

Tumor. The medulla extends one-half the distance beyond the yellow pigment and consists of necrotic tissue with a few areas showing fibrin. Remains of a few vessels cut longitudinally surrounded by pigment granules and choroidal chromatophores, not homogeneous but showing indications of alveolar arrangement. In the interstices between the alveolar areas, pigments chromatophores are to be seen—*not tumor cells*.

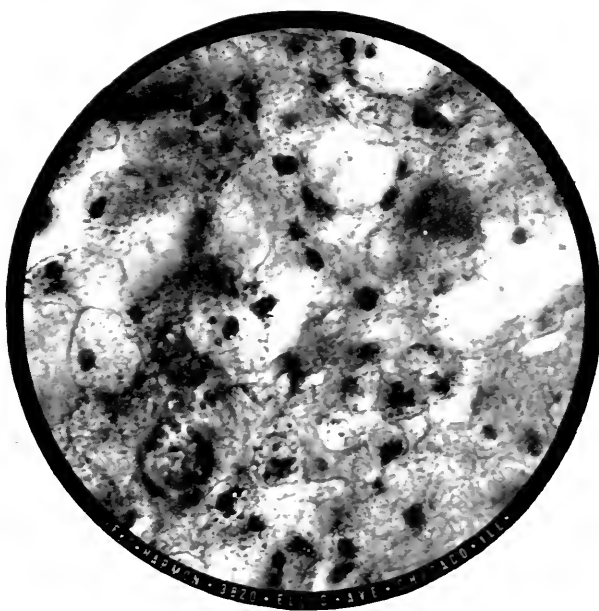
Pigment is canary yellow.

In the extreme temporal edge of the necrotic area are several areas of hemorrhage; red blood corpuscles are seen.

Cortex of tumor consists of tumor cells, especially in the tem-

poral and nasal edges of the tumor: thinner on the convex surfaces.

The tumor cells are epithelioid in appearance: small sharply outlined nuclei; a few granules and nucleoli in some cells; protoplasm clear. In some cells, especially near the choroid, are some melanotic pigment granules. Capillary blood vessels are throughout the tumor among the cells, between which the cells are arranged in strands or cords. The capillaries show only an endothelial wall. Towards the vitreal surface the membrane is composed of long spindle-like cells, with long rod-shaped nuclei—possibly the endothelial cells of the capillaries—outside of these are round pigment



cells, resembling degenerated retinal cells. A sharp line of demarcation exists between the tumor cells and the necrotic mass, but nuclei are numerous along this line of demarcation. The vitreous surface is sharply outlined, the other surfaces have a gradual transition into the pigmented choroid and sclera.

The yellow pigment in the medulla of the tumor produces negative results under tests for bile, blood pigment, iron test, glycogen, cholestrin, or corpora amylacea. The light canary yellow color excludes melanin.

Optic nerve.

Central artery deflected to the temporal edge of the tumor.

Lamina cribrosa is indistinct.

Central artery normal.

Neuroglia increased.

Pial and dural sheaths on the temporal side practically normal; on the nasal side, the sub-dural, or intervaginal space shows area of cell increase, staining deeply with haematoxylin; these cells are not embryonic, and do not resemble the tumor cells. From this area, blood vessels can be traced directly through the sclera to the tumor, so that these cells are probably endothelial capillary cells.

Pigment in the optic nerve is from chromatophores: a few are below the lamina cribrosa on the nasal side. On the temporal side a few pigment cells in the intervaginal space, but none on the nasal side.

Sclera. Posteriorly, near the optic nerve entrance, a few chromatophores, on both temporal and nasal sides, usually following blood vessels. None anterior to the equator.

Choroid. A degeneration of the choroid coat with fibrous tissue and chromatophores prominent.

Red blood corpuscles in the vessels. Increase of connective tissue all through.

Retina. Cannot be found anywhere. Only a line of pigment lying near the choroidal surface.

Ciliary processes atrophied and matted together in the exudate.

Ciliary muscle almost completely atrophied except a slight indication of it on the nasal side.

Pigment cells in streaks on the organized exudate.

Iris root thickened. Pigment clumped at root of iris posteriorly. A band of pigment extending from the tip of the iris almost to the posterior surface of the cornea and extending completely across the pupillary area.

Cornea. At the limbus a slight round cell collection. Corneal epithelium lost in some places. Bowman's membrane is intact from limbus to limbus.

Descemet's membrane where section is not torn is intact throughout. A few pigmented cells on the posterior surface. At the iris angle pigment cells extend beneath Descemet's membrane.

Diagnosis. The macroscopic sections show at once that it is not what the microscopic appearance of the tumor would lead us to expect, namely, a sarcoma. The cells are not sarcoma cells. The mass of the tumor is not fibrin nor organized blood clot, but necrosed tissue. It resolves itself into the possibility of one of two things; either an endothelioma or, what is more probable, a meta-

static hypernephroma. Metastases from hypernephromas most commonly occur not in the neighboring lymph structures, as is usually the case with other malignant growths, but are seen to follow the course of blood vessels. I quote the following paragraph from an authority on pathologic histology, as the description coincides so closely to the appearance of this growth:

"Histologically the tumor consists of a stroma made up of a rather close net work of capillaries and of cells intimately associated with the capillaries and arranged in rows, columns or masses within the meshes of the capillary net work. The cells are epithelioid in appearance and contain fat and usually glycogen. The association of the capillaries with the tumor cells is one of the distinctive characteristics of hypernephroma.

"The shape and arrangement of the cells, and the yellow pigment corresponds closely with the appearances in the adrenal cortex."

Three distinctive characteristics of hypernephroma are all wanting in this case. The presence of glycogen, a condition of haematuria, and a demonstrable tumor in the kidney region. Hypernephromas have been found which did not contain glycogen. Haematuria is not necessarily a constant symptom, but might occur at one time and be absent at another. There has been but one opportunity since the operation to examine the urine, and at this time it proved negative. If a tumor in the kidney region could be discovered, it would be sufficient to establish beyond reasonable doubt the diagnosis of a metastatic hypernephroma, even with the other usual characteristics absent.

The patient is a very fleshy woman, making it difficult to accurately explore this region. Cases are recorded, moreover, where small and apparently benign primary tumors, which caused no clinical symptoms, have given rise to metastases which have proved fatal. It is known that metastases occur in nearly all the tissues, most commonly in the liver, lungs and bones: I have been unable, however, to find in the literature of the subject any report of a metastasis occurring in the choroid.

A hypernephroma may be large and malignant, or extremely small and benign, often seen as an accidental necropsy finding. It may also be present for years as an apparently benign tumor, then suddenly assume malignant characteristics and quickly cause death.

The case will be watched with special interest, to see if a kidney tumor subsequently develops to confirm the diagnosis of a probable metastatic hypernephroma.

100 STATE STREET.

DEFECT OF ABDUCTION ASSOCIATED WITH RETRACTION OF THE GLOBE IN ADDUCTION.

BY JOHN GREEN, JR., M. D., ST. LOUIS, MO.

(Illustrated.)

Various authors have described a congenital anomaly of the ocular muscles, of which the most conspicuous signs are: (1) Partial or complete defect of abduction; (2) Some limitation of adduction, and (3) Retraction of the globe into the orbital cavity.

The condition does not appear to have been generally recognized as a clinical entity, most authors resting content with a simple description of the anomaly, without venturing into the field of speculation with reference to its causative factors. It re-



Figure 1.

mained for Duane¹ to collate all reported cases, and, in a masterly analysis, to establish once and for all this symptom-complex as a definite clinical entity. His paper, which is a model of painstaking and careful research, has thrown much light on the causes underlying the condition.

The typical features of the syndrome as summarized by Duane¹ are as follows:

1. Complete, or less often partial, absence of outward movement in the affected eye.
2. Partial, or rarely complete, deficiency of movement inward of the affected eye.

3. Retraction of the affected eye into the orbit when it is adducted.

4. A sharply oblique movement of the affected eye, either up and in, or down and in, when it is adducted.

5. Partial closure of the eyelids (pseudo-ptosis) of the affected eye when it is adducted.

6. Paresis, or at least, marked deficiency of convergence, the affected eye remaining fixed in the primary position while the sound eye is converging.

At the time of the publication of his paper (March, 1905) Duane was able to collect 54 cases, partly from the literature



Figure 2.

and partly through personal communications of ophthalmic colleagues. In view of the fact that Duane himself observed no less than six examples of the anomaly, it seems probable that the condition is less rare than the paucity of cases in the literature would indicate, and that it has been overlooked or incorrectly interpreted by observers less discerning than this distinguished author. My belief is that were the condition thoroughly understood by ophthalmologists generally the number of recorded cases would soon be greatly increased, and certain obscure points relative to the precise mode of causation of the unusual movements of the globe, would be definitely determined.

Two years ago it was my good fortune to encounter a typical example of the anomaly in question, and I venture to present an account of the case, together with photographs, which, better than any description, indicate the special features of the syndrome.

December 20, 1905, Mollie G., aged 9 years, came to my service at the Jewish Hospital Dispensary. The father, mother, two brothers and three sisters have no ocular peculiarities. One brother who died at the age of 7 years is said to have had "cross-eyes."

The mother has always noticed something "queer" about the child's eyes. Her general condition is excellent, and mentally she is on a par with children of like age. She has never suffered



Figure 3.

from headaches or asthenopic symptoms, and is brought to the dispensary simply because the eyes "look queer."

The patient holds the head slightly to the right, with the chin directed toward the left shoulder. With the eyes in the primary position (Fig. 1), the left is enophthalmic 1 mm. and divergent about 5 degrees. Each eye diverges slightly under cover. Fixation is habitually with the right eye. Tests indicate the absence of binocular vision. Diplopia cannot be evoked in any portion of the field of fixation. R. eye H. 15 \times 16 15. L. eye H. 15 \times 16 21. Pupils react normally to light and convergence. The eye-grounds are normal.

Rhinoscopic examination by Dr. W. M. C. Bryan is as follows: "Fula enlarged and bifurcated. Right nares occluded.

Left middle turbinate enlarged and pressed against the septum, the upper portion of which is deflected to the right. The left lower turbinate is moderately enlarged, but does not encroach on the septum. The right lower turbinate is very much enlarged, fitting the entire space. It can be contracted with adrenalin so that the patient is able to breathe on that side; but the opening thus secured is not sufficient to give a good view of the upper and middle meatus."

The difference in the width of the palpebral fissures is well shown (Fig. 1), the right measuring 8 mm., the left 6 mm. When the eyes are directed to the right the patient presents the appearance shown in Fig. 2. The right eye makes a full excursion to the right, its palpebral fissure widening to 9 mm. The



Figure 4.

left eye turns 15 degrees to the right in the horizontal plane and then shoots obliquely up and in. Its excursion terminates with the inner limbus, 3.5 mm. from the caruncle. Simultaneously with this oblique movement the eyeball recedes 3 mm. into the orbit, and the palpebral fissure narrows to 4.5 mm.

When the gaze is directed up and to the right, the left eye shoots straight up. On looking directly upward the left eye is directed obliquely up and to the left (Fig. 3). On looking up and to the left the excursion of the left eye equals that of the right. In passing from the position of dextroversion (Fig. 2), to levoversion (Fig. 4.) the ocular aspect changes in the following respects: The right eye makes a full excursion to the left; the left eye moves obliquely down and to the left until it reaches a position about 20 degrees beyond the median line, where it comes

to a full stop. In addition, the globe comes forward until it reaches the plane of the right globe. At the same time the right palpebral fissure narrows to 6 mm. and the left fissure widens to 8 mm.

The attempt to look directly down is represented on the left side by an oblique down and out movement of the left eye. When the gaze is directed down and to the right, the left eye follows the movement of the right. Movement down and to the left is well accomplished, the left eye passing through an arc of rotation equal to that of the right.

If convergence be attempted the right eye turns well in toward the nose, while the left eye remains motionless until the object is brought within 10 cm., when it diverges. If the near object be placed below the horizontal plane the motion of the left eye is straight down. With the right eye screened, the rotations of the left differ in no respect from its rotations in company with its fellow. After cocaineization the tendon of the left internus was firmly grasped by fixation forceps and the globe easily rotated outward until the outer angle overlapped the corneal limbus. A similar attempt to rotate the globe inward by grasping the tendon of the externus was only partially successful, as the patient complained of pain and tension when the inner limbus was 3 mm. from the caruncle. The sensation imparted to the fingers holding the forceps was that of a definite resistance to further inward rotation.

The patient, then, presents all the features described by Duane as typical of the syndrome, *i. e.*, partial absence of outward movement, partial deficiency of inward movement, retraction of the globe in adduction, a sharply oblique movement up and in and down and in, in adduction, and finally paresis of convergence.

A search through the literature subsequent to the publication of Duane's paper yielded two, and possibly three, additional examples of this anomaly. Jackson² reports the following case:

In a ten-year-old boy with occasional slight internal squint, the right eye could not be turned to the right beyond the median line; the left eye could be turned to the left only 5 degrees beyond the median line. Movements in other directions were only slightly limited. On attempting to look to the right the right eye came to the median line and opened widely; the left eye turned in, accompanied by narrowing of its palpebral fissure and the eyeball was retracted 2 mm. or more. On attempting to look to the left, the right turned in and was retracted 2 mm. or more, while the left came to the median line and opened widely.

The following is a synopsis of a case reported by Harman³ under the title "(Functional) Absence of Internal and External Recti Muscles":

A girl, age 16, presents no anomalies in the right eye. L. eye \angle 6/60, divergent 5 degrees. On directing the gaze to the

right, the left eye moves in 20 degrees and is strongly retracted. Concomitantly, the lids "fall in" on the sunken globe, thus narrowing the palpebral fissure. In this position the lower lid is separated from the globe by a deep sulcus from 1 to 2 mm. broad. Attempted movement up and to the right evokes an oblique movement up and in of the left eye, accompanied by narrowing of the palpebral fissure. Attempted movement down and to the right evokes an oblique movement down and to the right with retraction of the globe and the formation of a sulcus between the lower lid and globe. In the effort to look to the left the eye remains stationary, executing at times slight nystagmoid movements up and to the left and down to the left.

The case reported by Raia⁴ under the title "Congenital Paralysis of the Abducens of one Eye with Convergent Squint of the Other," while not indubitably belonging to this group, presents certain features of similarity:

A girl of 16 presented a slight convergence of the left eye. The right converges 10 mm. under cover, convergence persisting after removal of the screen. A distant object can be viewed with the left eye, but fixation soon passes to the right. When the gaze is directed to the left, the left eye fails to move past the median line, but the right eye makes a full excursion to the left, accompanied by narrowing of the palpebral fissure. There was no diplopia, the patient fixing with either eye at will.

Various theories have been advanced to account for the observed phenomena. As Duane remarks, it is inconceivable that the causative factors should be other than peripheral. The absence of abduction is explained on the supposition that the external rectus is absent or replaced by an elastic or inelastic connective tissue cord, a theory which in some cases has been borne out by anatomical findings. Certain authors, notably Heuck⁵ and Harman, ascribe the limitation of outward movement to a faulty insertion of the externus far back on the globe. Harman supports his explanation by comparative anatomy, having found that many of the salmon tribe and all of the herrings have the internal rectus inserted into the globe close beside the optic nerve, and that the externus is always faulty in growth and position in flounders. In the present case the definite resistance to passive traction inward (with forceps) seems to indicate that the externus is replaced by an inextensible cord.

The restriction of adduction is capable of two explanations: (1) With an inelastic externus, the normally inserted internus is thereby prevented from exercising its full function, or (2) the internus is inserted too far back on the globe to exert any notable inward rotation, this function being assumed somewhat inefficiently by the conjoined action of the superior and inferior recti. It

seems probable that both explanations hold good for different cases.

If we assume that the externus is replaced by an inextensible cord, it is easy to see how the eyeball, being hugged between this cord on one side and the contracting internus on the other, must necessarily recede into the orbit. Some authors, however, agree with Harman, that the "conjoined action of the superior and inferior recti muscles by their oblique line of pull from origin to insertion produce retraction of the globe." Duane opposes this theory on the ground that the obliques which would oppose this retraction must be assumed to be relaxed, which appears to be the opposite of the actual condition. According to Duane, the oblique movements observed in adduction "are due to spasmodic action of the inferior or superior oblique, probably often combined with spasm of the superior or inferior rectus." Harman however ascribes these movements to the "diverting of the eye up and down, when the object fixed is above or below the horizontal plane of action of the superior and inferior recti."

Much uncertainty exists as to the cause of the narrowing of the palpebral fissure when the affected eye is directed inward. It has been suggested by Parker that this is an example of a peculiar associated movement produced by synergic action of the facial and third nerve. This explanation cannot be accepted, for such cases as Harman's, in which the absence of any active contraction of the orbicularis is shown by the presence of a sulcus between the globe and lower lid. This author ascribes the narrowing of the palpebral fissure simply to a passive "falling in" of the lids on account of the lack of their natural support on the retraction of the globe. I am inclined to accept this explanation for my own case as the lower lid, although in contact with the globe, was certainly not in a state of contraction.

The insufficiency of convergence appears to be due, as Duane suggests, "to the mechanical hampering of the action of the affected internus."

Beyond correcting the refractive error, little can be done in the way of treatment. In the few cases, in which operation has been tried, the results have hardly justified the procedure. While tenotomy may be indicated in certain cases complicated by internal deviation, advancement is always contra-indicated "because it would increase the tension and hence the refraction." (Duane.)

1. Archives of Ophthalmology, March, 1905.
2. Ophthalmic Record, 1905, p. 248.
3. Trans. Oph. Soc. United Kingdom, 1905, p. 281.
4. Annals of Ophthalmology, July, 1905.
5. Zehender's Klin. Monatsbl. f. Augenheil, 1879, p. 275.

Reports of Societies

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting December 17, 1907.

DR. HOWARD F. HANSELL, Chairman, Presiding.

Microphthalmos with Coloboma of the Optic Nerve.

Dr. G. Oram Ring exhibited a patient showing *Microphthalmos with Coloboma of the Optic Nerve*. The patient was one of four children aged four years, and the only female. No other congenital abnormalities were present in the family. The cause was presumably the failure in the closure of the cleft found in the lower portion of the optic nerve in early fetal life.

The characteristics of the nerve coloboma were considered in making a differential diagnosis from the sclerochoroiditis of myopia. In the case exhibited the excavation in the disk was unusual in the inferior portion. The diameters were increased from above downward: the central vessels were irregularly distributed in two positions near the lower border as well as above. Maximum dilatation under mydriatic, 6.5 mm., tension normal, the eye amblyopic and strabismic, but not nystagmic. O. S. was normal in appearance, choroidal circulation was uncovered, the pupil dilated to a maximum of to 8.5 mm. Refraction of defective eye by retinoscope was $+1$ sph. $\ominus +4.50$ cyl. ax. 90, and that of the normal eye, plus 2.75 sph.

Corneoscleral Growth.

Dr. Ring exhibited a second case showing a small growth on the corneoscleral margin. The patient was a boy, aged thirteen years; first seen two months ago. The family and personal history as bearing on the case were entirely negative. The growth had been noted for two years, and he applied for treatment because it was thought to be increasing in size.

Under magnification the growth was found to be bilobed, that portion extending on to the cornea was vertically quadrate and rather translucent: the inner portion was distinctly pink in hue and somewhat more triangular. It was about 5 mm. at its base both in vertical and horizontal meridians, and encroached on the cornea at the inner limbus 1.5 mm., the outer edge being vertical. It was elevated about 2 mm. above the surface of the eyeball, and was firmly attached to the cornea, conjunctiva, and

underlying structures. The episcleral veins from the inner canthus extending to the growth were unduly filled. There was an opaque are at the inner margin of the cornea with a transparent area between it and the limbus, very suggestive of the usual senile are. The iris reaction was prompt and the media other than noted were clear.

As to the etiology it was thought that by the history and appearance of the growth, both syphilis and tuberculosis could be excluded. Possible irritation from a foreign body resulting in a granuloma was considered. The growth appeared to be benign, but a positive diagnosis could not be made until it was placed under the microscope. The history elicited was considered to exclude in as young a boy, gouty manifestation.

Dr. de Schweinitz called attention to the curious color and gelatinous appearance of the growth. It reminded him very much of two cases which he had seen: one in a woman fifty-seven years old, and the other in a man, forty-nine years old. Both showed the same gelatinous appearance, and encroached on the cornea. In one case it was thought to be malignant and operation was advised, but refused. Both patients were intensely gouty, and rather irregular in their habits of life, so antigout remedies were tried, under which the growths absolutely disappeared, during the course of several months. He thought they represented some form of gouty scleritis, perhaps, but it did not seem probable that the same explanation would hold in Dr. Ring's case.

Dr. Risley said that Dr. Ring had kindly given him the opportunity to study the patient a week ago. At that time the appearance of the growth left him in doubt as to its nature. It was not clear whether it might not be dermoidal in character, but the absence of the density characteristic of such growths reminded him of a mass he had seen developed around the bearded hull of a seed at the upper limbus of the cornea, which rapidly disappeared after removal of the foreign body. He called attention to the frequent malignancy manifested by these grayish growths at the corneal limbus, after attempts at removal, especially in patients after middle life, and cited a notable instance in the practice of the late Dr. Wm. F. Norris. In this case it recurred after removal and canterization again and again, and it was found necessary to remove the eyeball.

Foreign Body in the Iris.

Dr. Ring showed also a *Foreign Body in the Iris* with the following history: The man had been cutting steel wire cable,

and was struck in the eye by a minute sliver. The opaque wound of entrance in the cornea could be distinctly outlined, but at the time of his initial visit, which was about two weeks after the accident, the foreign body was imbedded so thoroughly in the iris tissue that it could not be seen; later, however, it was faintly outlined down and in.

The patient declined operation until one month after accident. It was felt that in addition to the use of the magnet a small iridectomy would probably be required because of the adhesion of the foreign body in the mass of iris exudate.

Dr. Ring said that it was interesting and important to note that the x-ray failed to show the presence of the foreign body presumably because of its small size and the fact that the edge evidently presented itself to the x-ray plate. This was the second case which had occurred in the hospital work this year in which the x-ray had failed to show the presence of a foreign body. In the case shown the plate was prepared at the hospital, but in an earlier case the localization was done by Dr. Sweet.

Dr. Sweet said that it was rare for a small metallic body which lacked sufficient density to be shown by the x-rays, to strike the eyeball with force enough to penetrate into the interior of the globe. He had radiographed the case referred to by Dr. Ring, and, although a narrow, thin body could be seen in the upper, inner quadrant of the slightly opaque lens, the plates failed to indicate its presence. The metal presented its thin edge toward the x-ray tube, and it was probably that the faint, linear shadow cast was lost in the denser shadow of the external orbital border.

In connection with the case Dr. Sweet referred to the penetration and lodgement of a small piece of a file in the lower portion of the iris of a child, aged ten months. Before opening the anterior chamber he passed the point of the magnet over the cornea in several directions, and succeeded in disengaging the metal from the iris, so that extraction through an incision in the cornea was successful, and iridectomy was not necessary.

Sclerocorneal Growth.

Dr. S. D. Risley presented for examination a patient with a dermoid growth at the sclerocorneal limbus, complicated with marginal keratitis. The boy gave a history of sudden onset of the trouble, which, together with the inflammatory symptoms present, gave to the dermoid growth the appearance of a granuloma developing around a foreign body. An incision through the mass and

careful search failed to discover any foreign substance. The growth was cauterized freely with trichloroacetic acid, hot salt stupes were continuously applied, and a subconjunctival salt injection given on alternate days. Under this treatment the dermoid became vascularized and finally disappeared, leaving a gray, flat nebula, corresponding to the base of the growth.

Bilateral Exophthalmos.

Dr. Risley presented also a *Case of Bilateral Exophthalmos*. The patient was an otherwise healthy colored woman, aged forty years, first seen three weeks before at the Wills Hospital. She complained of headache, and showed proptosis of both eyes directly forward, the protrusion being most marked on the left side. The lower fornix in both eyes was forced forward into a large roll of edematous and infiltrated conjunctiva, preventing closure of the lower eyelids. There was no pulsation or bruit, no evidence of Graves' disease, and no palpable growth in the orbit. The patient denied syphilis. A skiagraph by Dr. Sweet, and subsequent electric illumination excluded disease of the frontal and maxillary sinuses, as causal factors, and ill-defined shadows in the posterior ethmoidal and sphenoidal regions were of doubtful significance. After a week, under ascending doses of potassium iodide and mercurial inunctions, the pain ceased the proptosis diminished and the mobility of the balls improved. Dr. Risley pointed out that while disease of ethmoidal cells was not positively excluded, the proptosis was quite obviously due to some obstruction to the intake of blood from the ophthalmic vein, probably in the region of the cavernous sinus, not occluding absolutely the flow through this sinus, but retarding it. The improvement in the proptosis if continued under the mixed treatment he thought would favor the opinion that the obstruction was due to a gumma or node in the region of the cavernous sinus, notwithstanding his inability to discern any positive syphilitic history.

Dr. Holloway, referring to the fact that the proptosis was directly forward, said that Van Duyse had reported a case, in which the exophthalmos was due to a fibrosarcoma springing from the ethmoidal cells.

Dr. Harlan thought that the lesion might be situated in the sphenoidal sinus. The absence of pulsation would probably exclude serious trouble in the cavernous sinus. If the sphenoid was involved, the examination of the visual field might prove of importance.

Dr. Risley, in closing, said that interpretation of skiagraphs of the skull in the colored race was difficult on account of the thickness of the bony walls. Disease of the sphenoid and ethmoid could not be excluded, but he was more inclined to the diagnosis of gumma.

Bilateral Cicatricial Ectropion of the Upper Lids in a Patient with Extensive Lupus Corrected with Skin Flaps Taken from the Arm.

Dr. G. E. de Schweinitz demonstrated a patient with an extensively scarred face as the result of lupus, whose ectropion had been successfully relieved by skin grafts taken from the arm and sewed into place after the everted lids had been freed from their cicatricial connections and placed into normal position. On the left side the graft was 3.5 cm. long and 2.5 cm. wide, and became attached by first intention, without the slightest sloughing of any kind. On the right side the graft was 3 cm. long and 2 cm. wide, and also became firmly united except for a narrow strip at the inner end which became necrotic, but which did not materially vitiate the effects of the operation.

The interest in the case resided in the size of the flaps, which had so successfully gained union when surrounded by a tissue as badly scarred and diseased as that which the patient's face and forehead presented.

Epithelioma of the Inner Angle of the Eye Cured by X-Rays.

Dr. de Schweinitz also presented a patient, who, for a number of years, had been afflicted with a slowly growing epithelioma occupying the inner end of both lids upon the left side, as well as the adjacent nasal tissue, and which had sprung forward in somewhat knob-like protuberances. The entire growth was dissected from its bed, leaving a raw surface, which penetrated into the lids and side of the nose, but had not destroyed them. After this operation Dr. Pancoast applied the x-rays, and after the tenth treatment, the applications being made on alternate days, there was smooth, firm cicatrization and no malposition of the lids.

Dr. de Schweinitz referred to the interest which attached to the rapidity of the cure, as well as the importance in these cases of removing as much as possible of the growth and sacrificing as little as possible of the tissue from which it originated, thus giving the rays a chance to exercise their curing qualities in a much shorter space of time than if the greater mass of the growth had not been removed with the knife.

Dr. Harlan said the first case shown by Dr. de Schweinitz was an unusually successful Wolfe transplantation. With the skin of the face in the condition that it was in this patient, this was the best that could be done, as no flap could be taken from the neighboring parts. The final result, some years later, of the Wolfe operation was not likely to be so good as the immediate one, on account of the tendency of the flap without pedicle to contract excessively, or even to disappear by absorption. Dr. Fryer has reported a case in which there was little or no retraction in eighteen months, but six years after the operation the flap had contracted to less than a third of its original size, and the ectropion was reproduced. Cases have been reported, however, in which the result remained satisfactory for comparatively long periods.

Dr. Harlan's own preference was for the sliding flap of Diffenbach, particularly in ectropion of the lower lid, when the conditions of the case made it practicable. A defect in the operation was that the bared space left to granulate was below the canthus and the latter was dragged down by the cicatricial contraction. He had endeavored to avoid this by filling the bared space with another flap taken from the temple, and cases operated upon by Dr. Norris and himself had resulted very satisfactorily. Photographs of the patients were shown.

Keratoconus. Report of an Unusual Case.

Dr. C. W. LeFever (by invitation) showed a case of keratoconus in a man, aged forty-six years. His history was negative except for an attack of rheumatism six years before; he had used alcohol to excess for twenty years, but not within the past six years. There had been no previous ocular inflammation. Glasses were not worn until he was thirty years old. Records of changes made in the lenses during the past eight years showed a rapid increase in the astigmatism, until at present best vision was obtained in the right eye with -1 sph., \square -12 cyl. axis 75 degrees -20 10; in the left with $+2$ sph., \square -12 cyl. axis 100 degrees -20 10. For reading he required a $+3.50$ sph., which he used in a separate glass, placed on the tip of his nose in a horizontal position; with this he could read type 0.75 m. at ten inches. The apex of the cone was clear. It occupied an unusually low position on the cornea, and resembled very much a hanging drop of some viscid fluid. The great thinning of the tissues was evident by the ease with which the cone could be

indented with the oiled finger. Dr. Le Fever thought the low position was perhaps due to the fact that this was the middle of the palpebral fissure, and, therefore, had least support from the lids. He had thought at first that the horizontal position in which the reading lenses were held was for prismatic effect, but the same result could not be obtained with prisms. In addition to the careful correction of the refractive error, a myotic was constantly employed.

Dr. Thorington said that patients with keratoconus had a faculty of being able to improve their vision by looking through almost any strong cylindrical lens, if allowed to tilt it at some unusual angle; this was easily accounted for by the character of the conus, which was usually an oblique one. Personally, he got most satisfaction in trying lenses for keratoconus when he employed a cyclopeic, and used the retinoscope and the stenopeic slit. In regard to the etiology of the condition, he wishes to put on record the observation that in 4 cases out of 5 seen by him recently there was a history of hay fever. Dr. Le Fever's case was one of these, although the element of hay fever had not been mentioned in the history. One case in private practice had been examined in May for color blindness, the eyes being then otherwise normal. Six months later he returned after a severe attack of hay fever, and vision was found to be very defective owing to a typical keratoconus, which had developed during the attack.

Dr. Turner suggested that a still stronger reading glass might give better results.

Dr. Hansell thought at first that the advantage of the horizontal position of the reading glass was prismatic, but further consideration convinced him that the power of reading thus secured, was due to the cylindrical effect of the tilted spherical glass. The patient wore for distance — 12.00 cyl. axis 90 degrees. For near + 3.50 sph. By his peculiar manner of wearing this near glass he materially increased the correction for astigmatism adding a convex cylinder axis 180 degrees.

Iridocyclitis: Anterior Choroiditis and Total Detachment of the Retina in a Case of Cerebrospinal Meningitis: Histological Examination of the Enucleated Eyeball.

Dr. G. E. de Schweinitz and Dr. C. M. Hosmer (by invitation) described the microscopic appearance of an eyeball which clinically presented the symptoms of iridocyclitis and a yellowish mass in the vitreous removed from a child, aged ten

years, who had passed through a severe attack of cerebrospinal meningitis, the ocular lesions having been noted as early as the fifth day of the disease. They found marked iridocyclitis and cyclitic membrane formation, moderate anterior choroiditis, with edema of the posterior portion of the choroid, total detachment of the retina covered by a mass of fibrocoagulate, and distinct infiltration of the parenchyma of the cornea, with lymphocytes and leukocytes, as well as penetration of its layers by numerous bloodvessels. Cultures taken from the eye immediately after its removal had failed to demonstrate the presence of any microorganisms. Examination of the fluid obtained by lumbar puncture made during the child's illness revealed the presence of the meningococcus.

Dr. Chance said that in an examination of 40 cases of cerebrospinal meningitis he had found no case of uveitis. Dilatation of the retinal veins was constantly present, but he had not observed the discoloration in them which was recorded by Randolph. He had seen in a number of cases which had recovered, a plastic exudate from uveitis, but none among the number examined in the hospital during the acute illness.

Dr. Hansell said that during the epidemic of cerebrospinal meningitis three or four years ago, he had examined several children in the Philadelphia Hospital, and found no eye complications other than venous hyperemia of the retina.

Dr. de Schweinitz said that Heine had reported many cases of vitreous opacities, and Randolph had seen thromboses of the retinal veins. He thought the differences in findings must be due to a variation in the severity of the epidemics, owing, probably, to a difference in the virulence of the microorganisms.

Recurrent Vitreous Hemorrhages in Adolescence.

Dr. Frederick Krauss reported a case of recurrent hemorrhages into the vitreous occurring in adolescence. The patient was a twenty-four-year-old Roumanian Hebrew sheet-iron worker, who had hemorrhages into the vitreous occurring six times during a period of two and one-half years. The patient made a full recovery after each attack, the final vision being normal. The right eye was affected in every instance.

The hemorrhages apparently emanated from the choroidal vessels, about one disk diameter above and to the nasal side of the disk. There was no history of constitutional dyscrasia. There was some tendency to constipation.

The treatment consisted of rest, pilocarpus, and iodide of potassium.

A Case of Acute Double Miliary Tuberculosis of the Conjunctiva.

Dr. Howard F. Hansell presented a Lithuanian, aged thirty-seven years, who stated that he had been healthy all his life and had no trouble with his eyes until nine weeks ago. The skin of both upper lids was discolored, and the lids were swollen and drooping. Scattered over the conjunctiva of both upper and lower lids were numerous yellow, isolated swellings. They were round or oval, the size of a grain of wheat, circumscribed and sharply separated from the adjacent membrane, yellow in color as though they contained pus, slightly raised above the surface of the membrane and covered by epithelium. Material obtained by scraping the conjunctiva was examined microscopically and found to contain numerous tubercle bacilli. No signs of general tuberculosis could be detected. The pre-auricular and cervical glands were not enlarged. The eye-grounds were healthy. V. = 6/6, with — .75 sph.

A positive opinion as to the value of diagnosis and treatment by tuberculin could not at this time be given, but he believed both to be of great service. Calmette's suggestion of applying the tuberculin directly to the conjunctival sac and then determining by the reaction the presence of tuberculosis was not, in his limited experience, dependable. It was tried in the above case with negative result; also in 15 or 20 individuals known to be suffering with general tuberculosis the reaction was present in only one-fourth.

Dr. Zentmayer stated that he had seen this case on one occasion, about six weeks ago. The picture it presented was striking and, to him, unfamiliar. Owing to the fact that on massaging the lids fine vermicular jets of a yellowish-white sebaceous matter exuded from the mouths of the Meibomian glands he had supposed the lesion to be in the glands.

Regarding the value of the ophthalmotuberculin test Dr. Zentmayer called attention to a recent communication by Schiele in which it was stated that to insure an errorless conclusion as to the existence of a tuberculous focus elsewhere in the organism, follicular disease of the conjunctiva and trachoma must be excluded because in their presence a reaction which may cause serious complications occurs. Schiele believes that the fact that

in these two affections a local reaction is obtained supports his previous contention that these affections are related.

Dr. de Schweinitz said that the final test in the diagnosis would be the inoculation of some of the tissue into the eye of a rabbit, and he hoped the method would be tried by Dr. Hansell.

Dr. Hansell said in closing that the report was only a preliminary one, and that a rabbit's eye would be inoculated. He expected to try the effect of tuberculin injections in treating the patient.

A Rare Form of Complicate Cataract.

Dr. Zentmayer presented a paper on *A Rare Form of Complicate Cataract* and presented one of the patients. The cases occurred in a brother and sister, aged respectively twenty-five and twenty-three years. They presented the following characteristics: Cornea unusually large, very deep anterior chambers; irides tremulous; the large and small circles sharply differentiated, the larger being blue, the smaller brown; the structure of the iris appeared atrophic, the stroma consisting of converging straight lines entirely wanting in pattern; scleras bluish white porcelain-like; lenses milky white. Three of the lenses were discissioned, and in two instances but one operation was required the lens matter being fluid and flowing at once into the anterior chamber. The operations were followed by high tension requiring paracentesis for its relief. The ultimate vision was good in all instances. A first and a second cousin of the patients' mother had (senile?) cataract. With the exception of the absence of Ectropion, nyctar and the fact that operative results had been good the cases were precisely like those recently reported by Purtscher, under the title "A Little Known Form of Complicate Cataract."

EDWARD A. SHUMWAY, M. D., Clerk of Section.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

President Dr. F. Holz in chair.

A regular meeting was held December 9, 1907.

Dr. C. C. Darling presented a patient whose eye had been inflamed for a week and a half and previous to that vision had been blurred for a year or more. There was no itching, and symptoms were no worse in the summer than in the winter. There was a slight discharge and the lids stuck together in the morning, but these symptoms are now absent. Two smears were made, but no eosinophiles were found. A smear made from a small ulcer on

the conjunctiva was negative. A tuberculin test was not made. The mucous membrane was normal microscopically.

Traumatic Irideremia.

Dr. Thomas Faith reported three cases, which demonstrated that the diagnosis cannot usually be made at once, because of the blood in the anterior part of the eye, and that there is usually quite pronounced hemorrhage into the interior of the eye. The increase of intraocular tension, which is very likely to appear in a few days after the accident, may be explained by the coming in contact with the cornea of the remnants of the root of the iris, thus shutting off drainage through the sinus angle. It is not improbable, however, that the hemorrhage is a factor in the production of the tension. Eserin is indicated and has a favorable influence on the tension in some cases. Atropine is positively contraindicated.

DISCUSSION: Dr. H. B. Young said that the result following the use of atropin in Dr. Faith's cases bears out the usual findings.

Dr. W. A. Mann referred to a case he presented to the society several years ago, which resembled Dr. Faith's cases, but proved to be retroflexion of the iris following trauma. He could not follow the case long enough to determine whether the iris came back into place. The tension was high.

Dr. Casey A. Wood said that there is a class of cases of irideremia, of which he had seen two specimens, that is, entire evulsion of the iris following an attempt to do an iridectomy. The iris was torn away from its attachment. In one case of atactic glaucoma, removal of the iris entirely cured the glaucoma, and if there is anything in the theory, he said, that glaucoma is caused by the iris forcing itself against the sclero-iridic angle, this case was an illustration of it. The effect of eserin in such cases he thought emphasizes the fact that eserin does not always act in glaucoma, by pulling the mass of iris away from the angle, as there was no iris to drag away from the angle.

Dr. Faith stated that he had hoped some one would explain the action of eserin in these cases. In two of his cases it immediately reduced the tension. Another point of interest in two of these cases was the pronounced excavation of the optic nerve, while in the third, in which the tension was as great as in the other two, there was no excavation at all. He interpreted this to mean that the amount of excavation depends entirely on the kind of optic disc present originally.

Paplype—Tumor of Choroid.

Dr. Charles P. Small reported the case of a woman who received a blow on the eye. Severe pain followed, lasting for three days, but the appearance of the eye was unchanged. One week later the pain returned and became very severe. A foreign body in the globe was suspected, but the skiagraph was negative. The pain ceased almost suddenly after the use of dionin, and never returned to give her much annoyance. Tension was lowered. The lids were swollen and there was a discolored spot on the conjunctiva. Vision was destroyed. The eye was enucleated and a microscopic examination of the tumor showed it to be a metastatic hypernephroma.

DISCUSSION: Dr. Casey A. Wood thought that apart from the unusual pigmentation present in the tumor it suggested that it might be a necrotic area, a cholesterol deposit which had broken down. He had never seen anything resembling in appearance the sections of this tumor, and believed it to be another example of undiagnosed intraocular tumor. He agreed with Dr. Pusey that all useless, blind and painful eyes should be removed, and referred to Dr. Small's case as supporting this statement. There are, he said, many cases of intraocular tumor that are impossible of diagnosis and a large per cent in which diagnosis is very difficult.

Dr. Carlton, who made the microscopic examination of the tumor, stated that hypernephroma is a rather rare tumor. It may or may not be malignant. It is adrenal in structure and is believed to originate from an embryonic remnant either in the kidney or occasionally attached to the kidney, either within or without the capsule. The secondary tumors are peculiar in that they are discovered accidentally. In one case reported there was a metastatic tumor in the humerus which caused a fracture of that bone when the individual lifted a stove-lid. The arm was removed and no recurrence took place. In another case the secondary tumor was removed; there was a recurrence, and then none for two years. In Dr. Small's case it was impossible to diagnosticate the presence of a primary tumor, but the intraocular tumor did not resemble any other variety of tumor and contained cells identical with those seen in hypernephroma, that is, endothelial in character, and further, inasmuch as there is not normally endothelium in the eye, it was safe to assume that the tumor was a metastatic hypernephroma. Some of the cells in the tumor are pigmented, but the cells of the cortex of the adrenal are normally pigmented. The pigmentation might also be due to the fact that the tumor was

situated in the pigmented organ, and by pressure atrophy melanotic granules were scattered in the stroma of the tumor, and were taken up by the cells. If the tumor is not a metastatic hypernephroma, Dr. Carlton thought that in all probability it would have to be called an endothelioma taking its origin from some of the vessels in the choroid.

Dr. Small called attention to another interesting feature, namely, that Bowman's membrane was intact, so that a foreign body could not have penetrated the cornea.

Foreign Body in the Globe Nineteen Years.

By Dr. Henry Gradle. Complete enucleation of an eye, with the unexpected discovery of a foreign body in it. The patient, a young woman, 29 years old, was injured by a nail when 10 years old. The eye was sore for a few weeks, and then had no further trouble except that she was blind in that eye. During June, 1901, there was pain for the first time and an inflammatory reaction. There was no doubt about the eye being blind; the lens was cataractous, and there was tenderness indicative of cyclitis. It was impossible to quiet the eye until after the use of sodium salicylate, atropin and dionin having failed. A slight ptosis persisted. Last fall the inflammatory reaction recurred again, and when the conditions would not subside the eye was enucleated. A bit of a nail was found firmly imbedded in the optic nerve-head. It was not fully exposed, but the magnet demonstrated its presence. The iris is completely adherent to the lens; the lens is cataractous, and the choroid is entirely bleached. There is a hole in the iris through which the foreign body evidently entered. The interesting point is that the eye tolerated the foreign body for nineteen years.

Glioma of the Retina.

By Dr. Henry Gradle. A child, apparently in good health, suffered from inflammation of one eye during the eighth month, without a known cause. That eye never became quiet. In the course of a year it shrunk until now it is a perfectly quiet atrophic stump with opaque cornea, without tenderness. The other eye became involved soon afterward. Dr. Gradle saw the child first in April, 1901, when it was 28 months old. In the second eye there was a typical high-grade iridocyclitis, beginning to subside. The iris was tied down, there was moderate irritation, with no evidence of perception. There was no reason to

suspect anything except iridocyclitis, possibly tubercular in origin. The eye was normal in size. Atropin was prescribed. During the summer the eye had enlarged and had given the child discomfort. A raw granulating bleeding surface protruded from the lens, evidently causing the child much distress. The eye was enucleated. The tumor, which was present, had destroyed the greater part of the cornea, therefore the enucleation was made complete. The wound healed well and there was no reaction. On cutting through the tumor it was found that there was nothing left of the eye except the sclera and the periphery of the cornea. The rest of the contents of the eye had been changed into a mass which in the rear of the eyeball looked like a glioma, but in the front was a fungous-like, granulating, bleeding tissue permeated by hemorrhages, and between the yellowish-white gliomatous masses and the fungous masses there was a large cascated spot. The microscope showed a glioma with hemorrhage into the anterior part of the tumor.

Cyst of the Iris Following Injury.

By Dr. Henry Gradle. Young man, with high degree of hyperopia, and convergent strabismus, which was corrected by the use of glasses. The greater hyperopic eye showed vision of about 1/5. In 1900 the boy was injured by a brick. The glass of his spectacles cut his eye, causing a small wound at the junction of the cornea and sclera. The iris seemed to protrude subconjunctivally. He attempted after forty-eight hours to snip it off, but the forceps grasped nothing. The wound healed kindly, and there was no trouble until this summer, when the eye began to pain and it was tender to touch. In October he found a cyst in the iris. The iris had prolapsed into the wound at the time, but did not protrude. There was simply adherence of the iris to the edge of the wound, and the lower nasal edge of this incomplete coloboma had become changed into a cyst. Atropine gave relief for the time-being, but an iridectomy had to be done. It proved to be very difficult, but was finally excised. Evidently the cyst had adhered to the cornea, because after the wound had healed there was at the lower part of the cornea, where the cyst had been, a slight vascularity and grayness. Healing was uneventful and sight was as good as before. The eye was perfectly quiet.

A few years ago Dr. Gradle operated on a similar case with similar fortunate results. It was also a traumatic case, with en-

trance of the iris into the wound. The cyst in that case was of the size of a small pea, and was pressed against the cornea, causing cloudiness and reducing sight to 1/10. Iridectomy in that case was done easily, and a month afterward the sight was nearly 20/30. The cyst was cut out in a single mass.

Use of Atropin in Sympathetic Ophthalmia.

Dr. H. B. Young, Burlington, Iowa, reported a case of a man with one eye enucleated and the second eye involved. The origin of the trouble was a gonorrheal ophthalmia. The one eye showed much swelling of the cornea, and in the other there was a small perforation, with a large corneal staphyloma. A puncture was suggested, but refused. The attending physician did puncture it eventually, and now tension is plus and the incarcerated portion of iris is protruding quite markedly. This is the ninth week of treatment. A two per cent atropin solution is being used; the patient has been thoroughly mercurialized, but the increase in tension is becoming more marked. The question is, how much has the atropin to do with it? How much is due to the atropin when the iris is tied up in the corneal cicatrix? Will it make more trouble to use atropin than to omit it? The pupillary space is filled up. Has the atropin aggravated the increase in tension? There is very little pain. Is a paracentesis advisable with sclerotomy? Is there any hope of saving some vision in the affected eye?

Discussion: Dr. Gradle said that in his case the iris was adherent. He recalled two other cases of blind eyes, with cataractous lens, adherent iris, and recurrent attacks of iritis. Unmistakable benefit resulted from the use of atropin. He suggested that there probably was a little leakage between the anterior and posterior chambers. In one of the cases the stoppage of the atropin was followed by a ciliary injection, discomfort, and on its resumption the symptoms diminished in severity. In one case of severe iritis the tension was distinctly plus, but Dr. Gradle did not stop the use of the atropin, and the case terminated in recovery.

Dr. Casey A. Wood did not believe that it would make much difference whether atropin was used or not, because of the changes that had taken place in the interior of the eye. He did not believe that in every instance the exact *modus curendi* of atropin could be determined any more than in the case of eserine. He did not believe that atropin always caused the tension to rise, nor that eserine is always indicated in plus tension, because conditions vary. The local sedative effect of atropin cannot be questioned, and for that

reason he thought that Dr. Young ought to continue the use of atropin.

Dr. George F. Suker referred to two cases in which he used powdered dionin without getting any reaction. It had not been used before in either case. He also used it in solution, with the same results.

MORTIMER FRANK,

Secretary.

ST. LOUIS MEDICAL SOCIETY: OPHTHALMIC SECTION.

Meeting of October 9, 1907.

The Vice-Chairman, DR. J. M. BALL, *Presiding.*

Eyeball Containing Bone.

By Dr. A. Alt. An eye which he had removed a few weeks ago on account of sympathetic irritation. He had seen the patient fifteen years previously when he was a child of four years of age; he had then a large leucoma of the right cornea following blennorrhoea neonatorum in which a little space was clear enough to warrant the making of an iridectomy, which I did. He had not seen the patient again until two or three weeks ago, when he came complaining that for two years he had had severe pain in his eye, with symptoms of sympathetic irritation. When his eye was examined Dr. Alt felt distinctly that it contained bone and advised the removal of the eye, to which he consented. The sympathetic irritation disappeared at once. An interesting fact was that the wound bled for nine days, first quite freely and then oozing, until it gradually stopped nine days later. It was ascertained that he bled unusually freely when he cut himself; so he evidently is a haemophilic. There was a large anterior chamber, calcareous cataract and large bony shell at the posterior pole of the shrunken eyeball.

Forceps for Fixing the Everted Eye-Lid.

By Dr. A. E. Ewing. In many of the operations for entropion by the subsection method that Dr. Ewing had seen performed by Drs. J. Green and M. H. Post, as well as in those of his own experience, he has frequently observed the knife slip a little to one side or the other in the division of the tarsus because of the lack of a firm support to the lid. This would result in an incision with irregular margins. In a search among various forceps and clamps that have been proposed for fixing the eyelid he found that only the

one devised by Ratti could be used for working upon the lids when everted and at the same time give sufficient exposure of the under surface of the lid for an extensive wound near the margin.

This instrument serves very well but does not control hemorrhage efficiently. The several instruments here exhibited, descriptions of which may be found in the *American Journal of Ophthalmology* (February, 1903, and March, 1905), represent Dr. Ewing's efforts to devise a forceps which should control hemorrhage. The present one is an improvement upon that described in 1905, as it bears a plate against which the lid may rest while the incision is being made. In its application the plate is placed against the skin and the thinner blade is passed back of the tarsus on the conjunctival surface. With it either the upper or the lower lid may be held firmly in an everted position while performing the incision and the hemorrhage is very well under control.

As to the operation itself, considerable experience with it has convinced Dr. Ewing that it is rendered much more efficient and permanent by suturing the conjunctival edge of the standing or orbital portion of the tarsus into the bottom of the wound made by the tarsal incision, the sutures passing through the lid at the base of the cilia and being tied either upon the skin or on the conjunctival surface in the wound, as may be preferred. By this means the margin of the lid and the cilia are everted and are compelled to heal in the position desired. This procedure was described and illustrated in the *American Journal of Ophthalmology*, February, 1903. Up to the beginning of the present year he has employed this method upon forty-six different lids, thirty-one upper and fifteen lower. He has been able to keep track of thirty-seven of them and knows positively that the results have been good. Three of the earlier ones upon the upper lids were partial failures. Two of these he repeated with entire success; the other has caused so little annoyance that he is still keeping it under observation, as the few irregular cilia are gradually coming into line with those that are practically normal. In one of the lower lids there was also a partial failure because of the incision having been made too near the lid margin. This has been rectified by a repetition of the operation. Eleven of these upper lids and three of the lower had previously been operated upon by other methods from one to three times.

He has seen Dr. Green use only small interrupted sutures for closing the narrow skin wound which he formerly made near the base of the cilia. In the text-books there is illustrated a suture

credited to him, in which the upper lid is passed through the margin of the lid into the skin wound, then is reëntered beneath the skin in the same direction and brought out upon the skin well above the wound. He does not remember whether this suture was doubly armed and does not know how it was tied.

For the last twenty years in all of these operations that Dr. Ewing has seen him perform, Dr. Green has not removed the narrow strip of skin and has depended upon contractile collodion for causing the eversion, usually painting enough upon the skin opposite the wound immediately after the incision to maintain the eversion sufficiently to cause the wound to gap but not to interfere with the circulation, and the following day adding more until the gaping was wide and the eversion was excessive. This splint, if we may so call it, was repeated as was necessary and was continued for two or three weeks until the healing was well established. His idea was to do as little injury to the tissues of the lid as was possible, consistent with successful result. For the upper lid the results were usually satisfactory, but so poor in the case of the lower lid that in place of his operation he always resorted to some of the skin methods. Dr. Ewing has had better success upon the lower lid with his operation than he has seen with any other method, but it frequently failed. These failures have been an incentive to him to devise this modification.

DISCUSSION: Dr. John Green, Jr., stated that through the courtesy of Dr. Ewing he had been instructed in the technique of this operation several years ago. One of the principal advantages of this modification consists in the permanency of results. As to that he thought there could be no question. On one occasion he operated on a patient that had been previously unsuccessfully operated by the Green method. He did Dr. Ewing's operation on all four lids. The operation was done three years ago, and the result is as perfect today as it was at first.

If it becomes necessary to repeat the operation it can be done without impairing the integrity of the lid structures. That should count for a good deal in the selection of any operation. The quill suture which Dr. Ewing has described insures a more complete eversion of the anterior flap and at the same time prevents cutting of the skin surface by the fine sutures that pass through the lid. Dr. Green had been perfectly satisfied with the operation and expected to do it to the exclusion of all others.

Dr. M. Wiener stated that he had performed the operation a number of times and believed as far as the lower lid was con-

cerned it gave most excellent results. For the upper lid, however, he was inclined to adhere to Hotz's method.

Dr. Ewing stated that the pressure exerted by the clamp was not painful and yet was sufficient to control hemorrhage.

Staining of the Lower Lid from Injecting Argyrol into the Lacrimal Sack.

Dr. F. L. Henderson. The patient complained of epiphora, which had lasted a year. Stenosis of the duct and catarrh of the sac were found. Treatment consisted in washing out the sac daily with 10 per cent argyrol solution. This was done by inserting a syringe into the upper canaliculus and allowing fluid to escape through the lower. On one occasion the sac wall gave way and the solution passed into the sub-cutaneous tissue. Great swelling and discoloration followed. Potassium iodid internally in increasing doses was ordered. In one week the swelling had disappeared and the discoloration was reduced to a slate colored strip in the lower lid. The stenosis and epiphora responded quickly to treatment. A slight but perceptible discoloration persists. Potassium iodid internally and externally in the form of an ointment have been tried. Mercury bichlorid ointment was rubbed in faithfully with no result. Potassium iodid by cataphoresis was unsuccessfully employed. Patient refused to allow any hypodermic injections into the discolored tissue. The questions involved are: (1) What is the composition of the stain? (2) Is there any agent which will bleach or cause the stain to be absorbed? (3) How are we to get the bleacher or absorbent into contact with the stain, by the stomach, hypodermatically, by innunction, or by electricity?

DISCUSSION: Dr. M. H. Post thought in case of such an accident it would be well to use a hypodermic injection at once, in order to get the solution of iodid of potassium in contact with the argyrol at once. In his case, there being no lining membrane to the chalazion cavity into which the argyrol had been injected, iodid potassium was injected directly into the tissue. Dr. Alt stated that he had been so unfortunate as to have had a similar case to that of Dr. Henderson. He made an injection of argyrol with a small syringe of the eye dropper type with a fine gold tip, which did not allow of much force. He had frequently made such injections without trouble, but this time it went where he did not want it. Having heard of Dr. Post's case a little while before, he at once ordered the patient to take iodid potassium, 10 grains three times a day. That day there was no discoloration to be seen, but the next

day she came to the office and said: "Doctor, you have given me a nice black eye. Just look at me." She did have a pretty bad looking eye. He increased the dose of iodid potassium and each day the discoloration was less, and after five or six days no discoloration was seen. Probably the rapid bleaching was due to the prompt treatment with iodid potassium. He did not wait for any discoloration to show itself. He was sure it would soon begin.

Dr. J. C. Buckwalter stated that he had an experience similar to Dr. Henderson's, but that the discoloration rapidly cleared up and disappeared entirely in about four months.

Dr. H. Muetze stated that about two years ago he treated a patient for double dacryocystitis a number of times by sounding and injections of 10 per cent argyrol solution. One day this same accident happened, as related by Dr. Henderson. Within a few minutes the right lower lid had assumed a dark blue discoloration and in about ten minutes both lids were so badly swollen that the patient could hardly open the eye. He advised cold applications and gave iodid of sodium internally and within three months the discoloration, which later had changed to a light brown, had disappeared. Dr. John Green, Jr., stated that on one occasion a weak solution of silver nitrate intended for the sac found its way into the cellular tissue of the lid. A pressure bandage worn for several days reduced the swelling. The staining was never very intense and soon cleared entirely.

Dr. Henderson in conclusion said he had come for consolation and had gotten considerable, but not much help. The precipitate that is formed in the solution of iodid of potassium and argyrol is a slate colored precipitate small in quantity. On shaking the solution the whole becomes dark again. He feared that in rubbing into the lid an ointment of iodid of potassium he had not accomplished anything, owing to the dark residue which union with argyrol leaves. He would like to find something that will dissolve the slate-colored precipitate. The chemist who is working on this thinks it is oxide of silver. Yesterday he said he had found a perfect solvent for it. He poured his solution into the precipitate and in a very short time it all dissolved. The solvent was prussic acid, which, of course, precludes its use.

A Case of Unilateral Diphtheritic Conjunctivitis.

Dr. W. H. Luedde. J. W., male, 13 months old; first seen June 29, 1907. The patient had some fever and a sore mouth showing white patches supposed to be thrush. In-

spection revealed a membrane attached to the palpebral conjunctiva of the upper and lower lids completely covering but not attached to the globe. This membrane was easily removed. The membrane rapidly reformed on the conjunctiva of the lids and persisted for a long time, not having entirely disappeared when the parents removed the child from the hospital about five weeks after the beginning of the trouble. Fifteen thousand units of diphtheria antitoxin were given in all. Bacteriological examination demonstrated the presence of the Klebs Loeffler bacillus, first on the conjunctiva of the left eye, later in the mouth and nose. Right eye was never involved. The white patches in the mouth showed no signs of thrush or microscopic examination. There was present, however, a short, rod-shaped bacillus that could not be identified but in some respects resembled the Klebs Loeffler bacillus. Later examination proved the presence of the Klebs Loeffler bacillus in the mouth.

DISCUSSION: Dr. Higbee stated that at the St. Johns Hospital clinic he had observed a case of a child seven years old who manifested diphtheritic conjunctivitis in the left eye. To casual observation the case appeared to be one of purulent ophthalmia, but on closer inspection he found a membrane firmly attached to the palpebral portion of the conjunctiva. In the center, just in front of the cornea, the membrane had not entirely closed and through this opening one could see the freely movable eye ball.

The child had a temperature of 102° F. She was given 4,000 units of antitoxin the first day, and as there was very little improvement on the second day she was given 3,000 units more. Laryngeal diphtheria manifested itself in her sister about this time. The father objected to our using any more antitoxin, as he thought we were affiliated with the druggist for the purpose of fleecing him.

The child was taken to the O'Fallon Dispensary, where treatment was continued. It was learned later that the child made an uneventful recovery. Cultures verified the diagnosis.

DR. JOHN GREEN, JR., Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of December 21, 1907, in Colorado Springs.

DR. EDWARD R. NEEPER, Presiding.

Lenticular Opacities.

Dr. A. C. H. Friedmann presented the following cases: (1) Mrs. L., aged 62, showing arterio-sclerosis, chorio-retinitis and in-

ipient cataract. (2) Mrs. C., aged 28, with monocular, anterior, congenital capsular cataract. (3) Miss S., aged 34, showing symmetrical opacities in both lenses, extending diagonally across the lower-inner quadrant. (4) E. R., aged 8 years, with slight haziness in both lenses and dense opacities of each cornea. Dilatation of the pupil had shown that the lenticular opacities were real, not shadows caused by the corneal leucomata, and mydriasis produced no improvement in vision. There was a history of one attack of meningitis.

DISCUSSION: In the first case Dr. Melville Black called attention to the "silver-wire arteries" and other signs of far-advanced arterio-sclerosis, and advised treatment directed to the heart and circulation.

Cholesterin in Anterior Chamber.

Dr. E. R. Neeper showed Mrs. J. R. T., aged 49, with a family history of myopia and early cataracts, in whom cataract of the right eye had developed at about 29, and of left at about 35 years. The right lens was extracted in July, 1902, the left about three months later. Right vision was better than the left for about a year after operation; then it failed gradually, blindness resulting two years later. In December, 1904, pain was felt in the right eye for the first time, together with a foreign body sensation. Examination revealed an irregularly shaped mass of cholesterin crystals occupying the lower fourth of the anterior chamber, irritating both the iris and cornea by contact. Many isolated crystals showed on the upper three-fourths of the iris and in the pupil. There was no fundus reflex, and the tension was minus. The left eye showed opaque capsule and V. = $4 \frac{1}{2}$ 200.

DISCUSSION: Dr. Friedmann stated that he had attended this patient in 1902, when about 20 D. of myopia existed. The cataract extraction in the right eye was accompanied with a large hemorrhage from the iris. The patient proved intractable. V. = 5-6, after slow healing.

Dr. Melville Black considered removal of the irritable blind eye advisable to prevent sympathetic ophthalmia.

Dr. G. F. Libby agreed with this, advising dionin locally to relieve distress until enucleation was done, and advised needling the left eye.

Changing Lenticular Opacities.

Miss M. S., aged 32, a teacher, was also presented by Dr. Neeper, having consulted him for asthenopia with low error of

refraction, in September, 1903. Vision was then normal. Family history tubercular. Numerous pin-point opacities were scattered through each lens. When seen in December, 1907, the vision was still normal, with or without correction, and Dr. Neeper considered the opacities less dense, larger and of irregular form.

Attempted Absorption of Cataract.

Dr. Neeper also presented a half dozen cases showing opacities of the lens, variously placed and of varying size, from the striae of incipient cortical cataract to well-marked nuclear opacity. These patients, and about eighteen more observed by him in the past two years and reported fully at this meeting, were elderly people. Local and constitutional treatment had been employed. Dionin had at first been instilled in the office, beginning with 1 per cent solution and increasing to 5 per cent: after this was well borne, 5 per cent was instilled daily at home. Internally, the following general line of treatment was followed: Magnesia sulphate was first given to produce free catharsis, followed by a mild purge from calomel once a week; syrup of hydriodic acid, 10 to 30 minims, t. i. d.; free water drinking, and limited use of coffee. In two cases close work was permitted during two months of dionin treatment, the visual condition growing worse. On discontinuing close work but keeping up the dionin, improvement occurred in the next month.

Dr. Neeper thought hyperopic eyes were rendered liable to cataract from the added effort of accommodation, while in myopia the cause was malnutrition. In opacities of a light milky tint, with vision of 20/60 or more, he had seen improvement in vision and encouragement of patients in 98 per cent of cases. He always reduced the amount of close work, and had never seen ill effects from using dionin. His cases showed generally improved vision. The patients shown at this meeting made positive statements as to improved vision since this treatment was begun.

DISCUSSION. Dr. J. A. Patterson had observed benefit from dionin used in vitreous opacities. Even when the test type showed no improvement in vision, the patients got a better view of objects, and were more comfortable. He had never seen any harm come from the use of dionin.

Dr. Friedmann doubted if all lens opacities should be treated by dionin, but would like to see it tried in mature cataract, and also in some complications of cataract. He would not use it in cataract with glaucoma. When improved vision could not be demonstrated on the test type, he would attribute it to anticipation and mental effect.

Dr. E. M. Marbourg had used dionin powder in hundreds of cases in hospital work, with good effect only. He always gave iodine in reduced doses in the old.

Dr. Black urged careful classification of opacities, as capsular, cortical and nuclear. Cortical cases showed the best results, while those showing extensive lens involvement were not promising. He believed dionin delayed or reduced the development of opacities. In patients of seventy or more, if dionin did this he would permit a rather free use of the eyes for close work, on account of the mental effect.

Drs. Magruder and Libby had seen but little benefit from dionin in senile cortical cataract thus far, but would use it farther, together with Dr. Neepers's plan of constitutional treatment.

Dr. Black reported a man of 70, V. = 20/40, and with slight lens haze, able to read Jaeger 2 at 10 to 14 inches without glasses.

Dr. Libby reported much improved vision, lessened nystagmus and squint, and little or no photophobia, in the albino child presented at the October meeting, the improvement being due to wearing correction of 4 D. of mixed astigmatism, in amber lenses.

GEORGE F. LIBBY,

Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of January 18, 1908, in Denver.

DR. CHARLES H. WALKER, Presiding.

Acute Glaucoma Following Homatropin Cycloplegia.

Dr. A. C. H. Friedmann reported a woman of thirty-seven, who had consulted him recently for a change of glasses, stating that three days after examination under a mydriatic three or four years before the left eye became blind. After three days of active treatment vision had returned. Finding fundus and tension normal in each eye at several visits, and failing to get a reply to a letter sent to her former oculist, Dr. Friedmann instilled three drops of 1 per cent homatropin in each eye January 10, 1908. With correction, R. V. = 5/5, L. V. = 5/4. Following the examination, 1 per cent pilocarpin was dropped into both eyes. That evening the patient complained of blindness in the left eye, and about midnight sudden and severe pain, for which heat was ordered.

The next day acute inflammatory glaucoma was well developed, with hazy cornea, obliterated anterior chamber, medium-dilated pupil, fundus invisible, tension between plus 1 and plus 2,

V.= fingers at $1\frac{1}{2}$ meters. Eserin was then used (first $\frac{1}{4}$ per cent, then $\frac{1}{2}$ per cent solution), together with cathartics, heat and the high frequency current. This last seemed to relieve the pain and lacrimation. On the second day no improvement showed.

On January 13th this patient consulted Dr. Edward Jackson, who found the cornea steamy, the iris thick and swollen, conjunctiva chemotic, pupil 6 mm., tension between 1 and 2 plus, V.= fingers at 2 feet, and evident severe pain. A posterior sclerotomy was immediately performed, the tension becoming normal, pupil 5 mm., V.= fingers at 4 feet. A good night followed this operation. The day following the pupil became larger. One percent eserin had no perceptible effect on the condition. On January 15th Dr. Jackson did a broad iridectomy, under general anesthesia. The corneal incision was carried up into the sclera and a conjunctival flap was made. The iris, which was friable, was cut back to its attachment, then torn off at its root. The acute inflammation subsided and vision slowly improved.

DISCUSSION: Dr. W. C. Bane referred to a man 30 to 40 years old seen by him years ago, suffering from acute glaucoma, and who refused iridectomy. Under the use of hot applications and belladonna *internally*, by a homeopathic practitioner, the disease was apparently cured.

Dr. D. A. Strickler reported acute glaucoma following the use of homatropin in a woman aged thirty-two. The condition subsided quickly under eserin, heat and pulsatilla.

Dr. F. R. Spencer spoke of mydriasis appearing two weeks after the use of atropia in an eye injured two years before. After two months' use of eserin the pupil became normal, vision rising from 15/70 to 15/30 plus.

Dr. C. A. Ringle had seen slightly lowered vision, with normal fundus and tension but no glaucoma, following cycloplegia in a case of compound myopic astigmatism at 45 years.

Dr. C. E. Walker related a case of glaucoma in high myopia followed by the use of a mydriatic for keratitis. Relief followed iridectomy.

Dr. E. R. Neeper had found that the high frequency current relieved pain and was more help than myotics in acute glaucoma, and it was relied upon by him when iridectomy was refused.

Dr. M. Black referred to a case of glaucoma relieved as to one eye for five years by the use of eserin and as to the other for the past three years by eserin and the high frequency current. He had found relief from pain by the use of this current.

Dr. E. W. Stevens had seen but one case of acute glaucoma from homatropin used as a cycloplegic when 2½ per cent had been used at 30 years. He believed in the safety of homatropin used as a diagnostic means in suspected glaucoma, if soon counteracted by eserine.

Dr. J. A. Patterson reported retinal hemorrhages in a man of forty with slight kidney disturbance, following unwonted activity. The use of high frequency current was followed by iritis after the third application. Chronic irido-cyclitis developed eventually, with tension plus 2. Eserine proved irritating. Three anterior paracenteses were made, one iridectomy, and three posterior sclerotomies. Dionin gave most relief, finally.

Dr. Jackson resorted to homatropin in diagnosing suspected glaucoma if the patient would consent to immediate iridectomy, if required. Vision was likely to return if operation was done within ten days, except in fulminating glaucoma. He referred to Dr. Hyel's case in which glaucoma followed the use of duboisine. Iridectomy saved the sight of one eye, while that of the other was subsequently lost, although recurring glaucomatous attacks at first seemed to yield well to eserine.

Eutropion.

Dr. W. C. Bane showed a woman, aged twenty-four, with eutropion of the lower lid. Treatment by collodion and by removing an elliptical piece of skin had proved of no benefit to the lid, which showed some symblepharon at the fornix. About the middle of the outer side of the lower lid a condition resembling chalazion presented.

DISCUSSION: Dr. Walker suggested beginning pemphigus of the conjunctiva, as shown by cicatricial changes in the lower cul de sac.

Dr. W. A. Sedwick showed a man, aged thirty-four, in whom flying glass had cut through the upper eye lid, conjunctiva and part of the sclera, seven weeks before. Intraocular hemorrhage, including the anterior chamber, occurred immediately.

Under heat, boric acid, collyrium and atropia, vision returned to 20/20 in three weeks. Floating debris remained in the vitreous. Iritis soon developed, but cleared under atropin. When shown before the society a fixed thin web-like opacity and a movable but small mass of debris was observable in the vitreous.

Superficial Keratitis.

Dr. C. E. Walker presented an old woman with non-traumatic

superficial keratitis and brown corneal opacities deeply situated. The lower-outer quadrant of the cornea showed a grayish film. He thought cyclitis the probable underlying condition.

DISCUSSION: Dr. Bane related a similar case in his practice. Dr. Jackson thought the deep deposits were probably due to uveitis.

Adherent Leucoma.

A boy was shown by Dr. Walker with the lower half of the cornea densely opaque and adherent to the iris, due to an old injury from the claw of a cat. Frequent and painful hemorrhages into the anterior chamber occurred.

DISCUSSION: Dr. Neepor noted three tears in the iris, and questioned the probability of the lens being included in the scar.

Retinal Detachment.

A woman of forty-five was also presented by Dr. Walker, showing a small detachment of the right retina, associated with 4 D. of myopia, correction of which gave vision of 20/40. The field of the other eye was contracted to 10 degrees. Attacks of pain were benefited slightly by dionin, more by the high frequency current.

DISCUSSION: Dr. Jackson thought the right disk was red, hazy and dragged (*i. e.*, the nasal border was more prominent than the temporal), and considered myopia the cause of this and the pain.

Exclusion of the Pupil.

Dr. Melville Black presented a man of forty, a heavy smoker and drinker, in whom the pupil had become excluded except for a very small space above, the result of delayed treatment of iritis two years before. Iritis had again developed recently, and been relieved by free use of atropin and dionin. Autointoxication and low blood pressure were discovered. Treatment by sodium iodid and mercuric protiodid was proving beneficial. Dr. Black raised the question of prompt iridectomy, speaking of another case of pupillary exclusion followed by occlusion and loss of the eye.

DISCUSSION: Drs. Walker and Bane advised iridectomy.

Dr. Stevens used atropin in weaker solution but more frequently than formerly, and associated dionin with it. When adhesions persisted he waited about two weeks for them to atrophy, and then cocainized the eye and applied atropin again, often with final breaking of the synechiae. He also mentioned success in promptly treating one eye of a woman aged seventy, with dionin and atropin, whereas circular synechia developed in the other through de-

lay in seeking treatment. Atropin did not help this second eye, but dionin kept it comfortable.

Report of Cases.

Dr. G. F. Libby reported monocular keratitis in a woman of twenty-two, appearing nine months after the chancre of acquired syphilis developed on the lip. It was non-ulcerative, moderately inflammatory, and vision fell to counting fingers at two feet. The rash had appeared early and was successfully controlled by mercury hypodermically, once daily for forty days. Then protiodid of mercury, gr. $\frac{1}{4}$ t. i. d., was given; and later potassium iodid, gr. v. to xxx, t. i. d., both to be kept up, with occasional intermission, for two years. Under local treatment by atropin, yellow ointment, heat, and dionin later, the cornea cleared in three months except for a thin corneal nebulæ, and vision became normal.

Dr. A. C. Magruder made a preliminary report on the use of Calmette's ophthalmic-tubercular reaction: finding instillation of the same into the eyes caused a reaction in cases of pulmonary tuberculosis, but none in the absence of this disease. One-half per cent was the strength used.

Dr. Neepor reported high *anisometropia* in a girl of twenty, who wore with entire satisfaction, R. $+0.50 \text{ } \overline{\text{C}}$ — $3.50 \text{ cyl. ax. } 180^\circ$ degrees, L. $-7.00 \text{ } \overline{\text{C}}$ — $4.00 \text{ cyl. ax. } 180^\circ$ degrees. The correction was made under homatropin, the complaint being lateral headaches.

DISCUSSION: Dr. Black had found patients with full correction of *anisometropia* complained of looking down, which he attributed to hyperphoria of the eye wearing the stronger lens.

Dr. Ringle harmonized the difference between the eyes gradually.

Dr. Walker gave one pair of glasses for distance and another for near.

Dr. Meeker tipped the frame downward to average the difference if over 2 D. He had harmonized 4 D. of difference. He believed the peripheral images and the prismatic effect caused the trouble, and spoke of Knapp's case of a boy who tolerated a lens for aphakia in one eye. Personally he had harmonized but 4 D. of difference between the eyes.

GEORGE F. LIBBY, Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY OF PHILADELPHIA.

At a meeting of the society, held at the hospital on Monday, January 6, 1908, at 3:30 o'clock, Dr. Risley presiding, several cases were presented informally, viz.:

Dr. Posey, two cases of probable tubercular disease of the eyes; Dr. Norman Risley, a case of embolism of the central artery of the retina. Dr. Reiner, a case of monocular malignant myopia; Dr. Pontius, a case of foreign body passing through right eyeball and lodging in the brain. After which the following papers were read and discussed.

I. Dr. J. H. Dewey: Radical Treatment of Dacryocystitis.

In speaking of the treatment of dacryocystitis nearly all the text books, with a monotonous regularity begin with a simple collyrium, then splitting of the canaliculus, prolong syringing, destruction of the sac with caustics and the electro-cautery and as a last resort the removal of the sac is spoken of in far from encouraging terms.

That all of these methods, except the first two, are effective in alleviating the symptoms is acknowledged, and outside of the discomfort, pain and time consumed, the patient gains more or less relief and probably in some cases a cure effected.

The chief difficulty in extirpating the sac is the troublesome hemorrhage, which can generally be obviated by operating in a small wound.

In cases where the sac does not show a swelling or dilatation the dissection of the sac in toto is painfully tedious and while a source of considerable satisfaction in no way compensates for the time consumed.

In making a brief report of twenty-nine cases, the first five of which (and one subsequent in which there was dilatation of the sac) was removed whole, the technique of the latter operation was described. In this there was no attempt to dissect in toto, but after inserting the probe the sac was dissected out piece meal, the attachment to the lachrymal bone being thoroughly curetted after removal of the probe. Care also being taken not to cut the tendoo-oculi.

A cure was effected in all but two of the cases.

The conditions were bilateral in four cases. All but two were done under general anesthesia. Two were done by injecting Schleiche fluid.

Six cases were in adults and nineteen in children from 4½ years to 15 years in age.

All but two were females.

One failure was in adult, operation performed with Schleiche fluid, and one in a child following an attack of dacryocystitis three months previous. Three bilateral cases were in children

between 1½ and 6 years, all of whom were affected with acute dacryocystitis at the same time and operated on three months later.

These three children with one other were the only ones that had not had a long previous treatment with probing, syringing or both.

Removal of the sac always effects a cure, as there is no mucous tissue left to keep up the catarrhal discharge. Failure is only encountered when the operator has failed to remove the whole sac.

There were no subsequent epiphora.

Any other treatment gives only occasional cures. The immense amount of time and pain saved the patient is another factor favoring the operation, and instead of consuming weeks and months of treatment with generally only an amelioration of symptoms, they pass from the physician's care within a couple of weeks completely cured.

DISCUSSION: Dr. Zentmayer said those of us whose experience in the treatment of dacryocystitis antedates the revival of the operation of extirpation of the lachrymal sac, and recall the suffering endured by these patients in securing only an amelioration of their condition, cannot but feel that in the revival of this operation an opprobrium has been removed from ophthalmic surgery. The most ardent advocate of this operation, however, would scarcely urge its performance in all cases of obstruction of the tear-duct, nor would those, who support the more conservative methods of treatment, deny its necessity in certain conditions.

For consideration of the question, "When should extirpation of the sac be practised?" we may divide lachrymal obstruction, and its sequelae, into two groups:

1. Stricture without purulent secretion.
2. Stricture with purulent secretion; and subdivide the second group into: (a) those with, and (b) those without distention of the sac (mucocele).

I think that the cases in group 1 should all be treated by syringing and probing. In the first class of the second group, except under certain conditions, I would also use syringing, probing and styles. The latter only when the patient is so situated that he cannot receive systematic treatment. The exceptions would be when it is necessary to perform an operation upon the eyeball in which infection is to be dreaded; or in the presence of an infected corneal ulcer. In either circumstance extirpation should

be advised. In the second class of group 2 I would not temporize but would urge immediate enucleation of the sac.

As to my personal experience: I have performed the operation about fifteen times, always for dacryocystitis and usually with distention of the sac. In two cases, both in children, some suppuration from the canaliculus continued. This was checked by passing a galvano-cautery into the canaliculus. In the third case, an adult, a fistula exists.

Regarding the technique of the operation, I believe Dr. Dewey does with premeditation what we often do by compulsion, that is, remove the sac piece meal. I always attempt its removal in toto, but severe hemorrhage, which usually obscures the field, renders this at times impossible.

Dr. Schwenk inquired as to the effect of this operation upon the health of the nasal tissues, to which Dr. Dewey replied that he believed no special trouble ensued, he had not seen necrosis follow.

Dr. Posey said the healing after this operation is usually very soon accomplished, but sometimes annoying epiphora followed, so that Holmes always excised the gland as well. In a case reported by Veasey, however, suppuration of the cornea ensued on removal of the gland. Posey believes it to be unwise to remove the sac in acute primary disease. He prefers to slit up the canaliculus, to probe the duct, and to insert a style, with either.

Dr. Risley expressed his gratification over the large experience Dr. Dewey had had and the result he had reached in the extirpation of the lachrymal sac. In his own experience, the necessity for the operation was rare, and he doubted the expediency of its employment in young children. He exhibited the only case in which he had extirpated the sac and the patient was still in the wards of the hospital. The patient was in the third stage of trachoma, but with a persistent vascular cornea which had proved rebellious to treatment. As a last resort the sac, or what he supposed to be the sac, was extirpated. After three weeks he was gratified at the marked improvement in the corneal condition; the constant reinfection of the eye, evidently having been prevented by the removal of the sac.

His technic in the operation differed from that employed by Dr. Dewey in one respect. The incision was made above the tendon of the orbicularis, which was not disturbed, the top of the sac exposed and by careful dissection removed down to its entrance into the bony duct. The bony duct was not curetted. The incision

was then closed by sutures and a firm compress applied under a roller bandage. The recovery was without reaction and the result, at the time of presentation of the case, in all respects favorable.

II. Dr. Goldberg: Pathological Reports and Demonstrations.

Dr. Goldberg exhibited a number of microscopic and gross eye preparations, and called special attention to two of the number. The first, an unusual form of keratitis, which was followed by an attack of glaucoma. In this case the cornea had split into two equal parts, a superficial, composed of a dense, opaque, cartilaginous material, and an intact portion, which was perfectly clear. The interesting feature of this case was the epithelial invasion of the diseased cornea, which resembled Nature's effort to cover the remaining clear portion with healthy epithelium. In addition to these changes, the entire uvea was found almost completely fibrous, while the retina showed a fibromatosis. That fibrous changes could progress to such a late stage before the onset of a glaucomatous attack, Dr. Goldberg thought very unusual.

The other case reported in detail was an eyeball enucleated for sympathetic inflammation in the fellow eye. This specimen showed giant cells and transitional epithelioid cells. The case was that of a "proliferative uveitis."

DISCUSSION: Dr. Zentmayer said he had examined two eyes enucleated because of their having excited sympathetic inflammation which showed the characteristic changes spoken of by Dr. Goldberg. There is, however, another side to the question. Ruge, who has examined a great number of eyes, removed for traumatic irido-cyclitis, believes these changes indicative of a chronic uveitis and in no way pathognomonic of exciting inflammation.

III. Dr. G. Robinson Detailed Histories of a Case of Aniridia and a Case of Keratoconus.

Dr. Radcliffe said the treatment of aniridia is difficult because there is no known pathologic condition attending it, and that therefore our efforts must be confined to the adjustment of such forms of spectacle lenses as shall act as diaphragms for the exclusion of peripheral rays.

In the management of cases of keratoconus, Radcliffe attends to the general health of the patient, for he believes the conus formation is dependent upon a lowering of the vitality of the individual. Much relief of the symptoms is afforded by the use of special glasses, but unless one gets and holds the co-opera-

tion of the patient disappointment follows. After discussing the several varieties of operations devised, he said he believes the wisest plan is to cauterize the cornea with the galvano or actual cautery.

Dr. Posey said that the formation of the iris would be imperfect if there was an interference in the development of the blood-vessels of that structure. This failure may give rise to colobumatos irises, as only a segment of the iris may be present. He does not agree with Tweedy that conical cornea is due to a failure of the interior of mesoblastic tissue, for he has never seen a case of coloboma of the iris associated with conical cornea.

He told of his having seen Critchett treat a conical cornea by cauterizing in streaks directed from the periphery toward the apex. To excise a segment of the cornea demands extraordinary skill, for the evacuation of the chamber may allow the lens to fall forward and be wounded. He hoped Dr. Schwenk would relate his experience in the treatment of certain cases in which paracentesis had been performed.

Dr. Schwenk told of a case in a young woman for whom he had prescribed R. — 6 — 17 ax. oblique — 20 20. L — 3 — 12 C = 20/30. He cauterized the apex of the corneas with the actual cautery, because the electric cautery alarmed the patient. He expected he could easily penetrate the membrane, but he found it very resistant. He then tapped the chamber at the periphery of the cornea. After eighteen months the visual result with — 5 cyl. = 2/3, and T could be read.

The second eye was operated on with less success, for the scar was so large and dense that an iridectomy had to be performed later. Some time he intends to transfer clear cornea over the pupillary area by means of a peripheral flap operation. In this person he had seen successive crops of boils and styes follow after each operation.

Dr. Fisher asked whether or not antero-posterior opacities of the lenses were not associated with aniridia. Dr. Risley said it depended upon the age of the patient, yet Fisher stated that all the cases he had knowledge of had been in children under ten. Dr. Risley reached only two or three cases, in none of which had he seen opacities.

Dr. Radcliffe said it would be interesting to observe the effects of heredity in such cases.

IV. Dr. S. H. Brown: Relation of Pathological Conditions of Fifth Nerve to Diseases of the Eye.

In Dr. Brown's essay the various pathologic conditions of the eye referable to the influence of the fifth nerve were dilated upon

at length. The paper began with the most modern anatomic considerations of the nerve in an endeavor to show a close structural association with other cranial nerves. While the detail of this portion of the paper was somewhat prosy it serves to substantiate the contention of the essayist. The various clinical conditions that could be shown to be in any way concerned by alterations centrally or peripherally, of the fifth nerve, were taken up seriatim. Reference was made to the various ocular muscle conditions, corneal affections, reflex blindness, conditions referable to disease of the teeth, and other ocular affections and the effect that might be secondary to alterations in the trigeminus. The Badal operation, the Donder's view of glaucoma, and the Schmidt-Rimpler theory of sympathetic diseases were aroused from a more or less commendable lethargy to lend credence to the views advanced in the paper. While the views of different observers vary greatly as to the real influence of the trigeminus in the cases cited, it remains certain that the close association of the nerve, both centrally and peripherally with other nerves, must of necessity have some close association, functionally or pathologically, and as the writer states, it was only with the purpose of reviving an interest in the possibilities suggested by the anatomy of the nerve that this essay was written.

DISCUSSION: Dr. Zentmayer said in regard to the associated implication of the third nerve in herpes zoster, it is of interest to consider how this occurs. Several views are held concerning it. One, that in herpes zoster the lesion is in the Gasserian ganglion and that the inflammation is propagated along the first branch of the trigeminus involving the third nerve through the ophthalmic branch, which comes into intimate relation with it at their entrance into the orbit. A second view is that both are the expression of a common cause. In the only case that I know of which has come to section there was found a thrombophlebitis with a focus of pus in the muscle. Abadie believes herpes zoster is due to a trophic disease of the blood vessels and not to a nervous lesion.

Dr. Fisher said that in his early years it was believed that many diseases were due to the reflex actions of disturbance in other organs more or less remote, but in recent years this idea has been greatly ignored, because, as he believes, ophthalmologists are ignorant of the effects of general disease. He hopes therefore that the reading of Dr. Brown's paper may lead to us paying greater attention to the connection existing between diseases of the eye and the so called reflexes.

V. Dr. Milton Griscom, the Senior House Surgeon, presented
a Report of the Cataract Operations Performed in the
Wills Hospital from October 10, 1907, to January 1, 1908.

This report was mainly statistical and dealt with the results, mediate and immediate, of the forms of operation in sixty-one cases. The number of days before the wound was closed in each case was noted, the number of days in which the patients were kept in bed as well as the time spent in hospital were recorded.

BURTON CHANCE, Secretary.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED
KINGDOM.

Thursday, December 12th, 1907.

R. MARCUS GUNN, F. R. C. S., President, in the Chair.

Abstract of Mr. Nettlehip's paper, "On Some Cases Possibly Allied to Tay-Sachs's Infantile Retinitis."

It was suggested that the amaurotic family idiocy of Warren Tay and Sachs, although usually fatal in infancy and limited to children of pure Jewish origin, might sometimes be milder, allowing the child to live several years, or even to grow up; and that many families of "Gentiles" contained more or less Jewish blood. The author thought that cases such as those described by Dr. F. E. Batten, Mr. Mayou and others, in which amauropia, with slight changes in the macular region, came on a few years after birth and was sometimes associated with progressive cerebral degeneration, might be mild examples of Tay's disease. Also, that the same might be true of certain cases of amblyopia counted as congenital in which there was central defect in the field and sometimes nervous or mental failure, but no tendency to early death. In the best-marked of these cases there was color-blindness, often total and complete, and day-blindness, but in the less severe ones there might be no color defect and no dislike of strong light. All these forms of non-fatal amblyopia were, like Tay's disease, liable to run in families.

From C. Deirius Marshall, 112 Harley Street, London.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. E. V. L. Brown of Chicago has returned from his recent visit to Vienna.

The marriage is announced of Dr. Wm. H. Wilder and Miss Caroline Rothschild, on December 25, 1907.

During the month of November, 1907, the Charity Hospital of Philadelphia treated forty-one eye patients.

Dr. Homer J. Rhode has been appointed ophthalmologist on the staff of the Reading Hospital, Reading, Pa.

Dr. William Cheatham of Louisville, Ky., has been elected Vice-President of the Louisville Clinical Society.

The Philadelphia Eye, Ear, Nose and Throat Hospital during the past year treated 682 new cases and 1,266 old cases.

The marriage of Dr. Dwight C. Orcutt of Chicago to Miss Grace Leach of the same city took place December 3, 1907.

Dr. Christian R. Holmes of Cincinnati, Ohio, broke one of the bones of his right wrist recently while cranking his automobile.

Dr. Paul J. Pontius has been elected to succeed Dr. Wm. W. McClure as chief surgeon of Wills Eye Hospital, Philadelphia.

The Hereford, Eng., Victoria Eye and Ear Hospital recently received \$1,000 by the will of the late Mrs. Sarah Elizabeth Reed Parry.

The Wills Eye Hospital of Philadelphia received a provisional bequest of three properties on Ridge avenue, by the will of the late Edwin S. Wills.

Dr. Archibald Thomson has been made ophthalmic surgeon with Dr. Burton Chance, assistant ophthalmic surgeon, to the Pennsylvania Railroad at Philadelphia.

Dr. John E. Covey died recently in Bloomington, Ill., of cancer of the stomach. Dr. Covey was prominent as an ophthalmologist and was a graduate of Rush Medical College, Chicago.

Dr. John B. Catlett has been appointed physician to the Virginia School for the Deaf and Blind at Staunton, Va., to succeed Dr. Benj. M. Atkinson, who resigned after twenty-eight years' service.

Dr. J. Homer Coulter, once well known as an ophthalmologist in Chicago, died in the Illinois Northern Hospital for the Insane at Elgin, Ill., from general paralysis of the insane, at the age of 46 years.

In a report on the medical examination of infant schools in London, Dr. Kerr emphasizes the benefit to be derived from the opportunity to check such lesions as corneal ulcerations and early ophthalmia and otitis.

In the December RECORD it was stated that Dr. B. B. Griffith had been appointed oculist and aurist to the Riverside Hospital, Paducah, Ky. This was an error which we wish to correct. Dr. H. G. Reynolds of Paducah received the appointment.

An error led to the statement in the December RECORD that Dr. H. C. Haden had resigned as clinical professor of eye, ear, nose and throat in the University of Texas. Dr. John B. Haden is the professor of clinical ophthalmology and so remains, while Dr. H. C. Haden resigned the chair of clinical diseases of ear, nose and throat.

Training in Medical Organization:

The students of the University of Pennsylvania Medical School have formed an organization the purpose of which is to acquaint the undergraduates with the workings of the American Medical Association, after which it is very closely modeled. The various student societies take the place of the state organizations and elect members to a House of Delegates, which transacts all the business of the association. An annual meeting is held at which papers are read by chosen members, thus encouraging original research and a scientific spirit. The organization is named The Undergraduate Medical Association of the University of Pennsylvania, and already has over two hundred and fifty members.

The annual meeting of the Chicago Ophthalmological Society on January 13th was made the occasion for tendering a banquet to Dr. F. C. Hotz, the retiring president, and some of his intimate friends. The banquet was given at the Chicago Athletic Club. The business meeting was held first, with Dr. Hotz presiding. The following officers were elected: President, Dr. T. A. Woodruff; vice-president, Dr. C. P. Pinckard; secretary-treasurer, Dr. Morti-

mer Frank; councillor, Dr. Willis O. Nance; councillor to the Chicago Medical Society, Dr. Thomas Faith. Dr. Gradle was toast-master and called upon many speakers, all of whom eulogized Dr. Hotz for his signal services to ophthalmology. Among the speakers were Dr. A. E. Bulson, Fort Wayne, Ind., Dr. Casey Wood, Oscar Foreman, Dr. Adolph Schirmer, Dr. Frank Allport, Dr. Franklin Coleman, Dr. E. V. L. Brown and Dr. Wm. H. Wilder. Dr. Brown Pusey informed the society of the serious illness of one of its well known members, Dr. Frank A. Phillips, and arrangements were made to send him flowers with the good wishes of the society. Dr. Phillips has gone South to recover his health.

Under the head Examination of Infants, the medical officer to the London Education Committee in his report gives the results of the medical examination of infants by Dr. Niall in fourteen schools, varying from the slum areas at Vauhall and North Lambeth, through artisan areas of Lambeth and Kennington to the vastly different districts of Brixton and Norwoold. Information, as far as the teachers could furnish it, was obtained regarding the district, parents, amount of female labor, defects. Any children presenting obvious defects were brought out, but they were never stripped. This method gives results which considerably understate the true facts. Of 5,310 children in attendance 14.9 per cent, nearly 1 in every 7, was picked out as requiring detailed examination.

Two neighboring schools, Walnut Tree Walk (9.3 per cent), and Lollard Street (26.7 per cent), presented the lowest and highest number defective. The latter is in a poor district, many of the mothers being wage earners and their children neglected. A great number of the children are in a dullards' class, and 47 per cent of these have some defect often caused by dirt conditions.

Of the children with obvious defects the percentages were:

| | Percentage of Children in Attendance, | Percentage of all the Children with Defects having Particular Defect. |
|--------------------------|---|--|
| Vision | 2.9 | 19.8 |
| Hearing | 1.2 | 7.7 |
| Physique | 1.1 | 27.5 |
| Speech defects | 0.78 | 5.25 |
| Mental defects | 1.1 | 9.75 |
| Tonsils and adenoids | 1.7 | 31.5 |
| Enlarged cervical glands | 2.1 | 11.5 |
| Discharge from ears | 0.5 | 3.5 |

In five schools of Hammersmith and Fulham Miss Janet Campbell inspected the new admissions to the infants' departments, together with a few older children, and actually recommended 196 out of 909 examined to have some form of medical treatment. Of the 104 newly-admitted infants at Campbell Street Mr. Elmslie noted 46 as having defects requiring remedy.

The age of new admissions varies much with the district, as pointed out by Dr. Marion Hunter, in reporting on six Wandsworth schools. She classified them as poor, medium and better class schools, and worked out the average ages of the newly admitted children presented to her as 3 9 12, 4 5 12, and 5 years old.—*British Medical Journal*. ———

The eleventh International Congress of Ophthalmology will be held in Naples April 2 to 7, 1909. Honorary president, Prof. Marc Dufour; honorary vice-president, Dr. E. Landolt; president of the organization committee, Prof. Arnaldo Angelucci.

REGULATIONS OF THE CONGRESS.

1. In conformity with the vote given at the last sitting of the Congress of Lucerne, it has been decided to hold the eleventh International Ophthalmological Congress at Naples.

2. The reunion will last from the 2d to the 7th of April, 1909, with four morning sittings dedicated to discussion and one afternoon sitting for demonstrations.

3. Those ophthalmologists subscribing to the Congress and wishing to communicate their work, must forward same, together with their subscription, between the 1st and 30th of September, 1908. All works must be compiled in one of the official languages of the Congress, viz., Italian, French, English, German and Spanish¹ and the extension of every communication must not exceed 5 pages of the form of the paper used in the documents of the preceding Congress.

4. The documents of the Congress will be compiled in three parts. The first part will be sent before the meeting to those who shall have signified their intention to be present, and will contain the printing relating to the work of the commission nominated at the preceding Congress to refer to its official themes:

1st. *To fix, with regard to an indemnity, the value of a lost or damaged eye.*²

(1) In this Congress the committee intend making the Spanish language also official, in view of the great increase of interest which has taken place in ophthalmology in Spain and in Latin America.

(2) Some members delegated to the Congress of Lucerne to treat on this subject have expressed their intention to abstain from referring to it, holding an agreement on such an argument difficult especially on account of the diverse legislation which governs this matter in their respective countries.

2d. *Unification of the measure of the visible force and unification of the notation of the meridians of the astigmatism.* The second part, which will be forwarded shortly after, will contain the print of communications received in time and in the order of the date of their reception. The third part of the documents which will be dispatched after the Congress will contain the minutes of the discussions and the sittings of demonstration.

5. The reunions of the Congress will be limited to the discussions only of works already published in the documents. The minutes of the discussions will be edited from the résumé presented by the author and from that of the secretaries of the sittings.

6. At the sitting of demonstration apparatus, preparations, instruments, methods of operations, projections can be presented.

7. The Congress will proceed, at the first sitting, to the nomination of a definite office of presidency, which will have the direction of works and sittings, and will fix the orders for the days of sitting.

8. Any member having obtained permission from the president will be able to speak for not more than five minutes, nor more than once during the same sitting on the same argument, unless the assembly, being consulted thereon, decides otherwise.

9. The Congress votes by rising or sitting on the deliberations being put to the meeting.

10. To the Congress is annexed an exhibition of all kinds of oculistic objects, ancient and modern, of which mention will be made in the third part of the Congress documents. The rules which will govern the exhibition will be indicated in a separate circular.

11. Tables necessary for works will be at the expense of the authors themselves.

12. The president of the Congress will definitely decide regarding any incident not foreseen in the present regulation.

13. The subscription for the Congress is 25 francs for members and 10 francs for every member of their family. Notification of presence, subscription and communications relative to the Congress should be addressed directly to Prof. Arnaldo Angelucci, R. Clinica Oculistica in S. Andrea Delle Dame, Naples, or by means of the correspondence members of the relative countries.

The members' ticket which those taking part at the Congress will receive is strictly personal and available for no one else. The same will give free entrance to the Museums and public monuments, as well as obtain reductions from railways, and to other pleasures, which will be indicated later.

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Original Articles

PROBABLE TUMOR OF THE PITUITARY BODY WITHOUT GIANTISM BUT EXHIBITING A BILATERAL NASAL HEMIOPIA.

CASEY A. WOOD, M. D.

CHICAGO.

(Illustrated.)

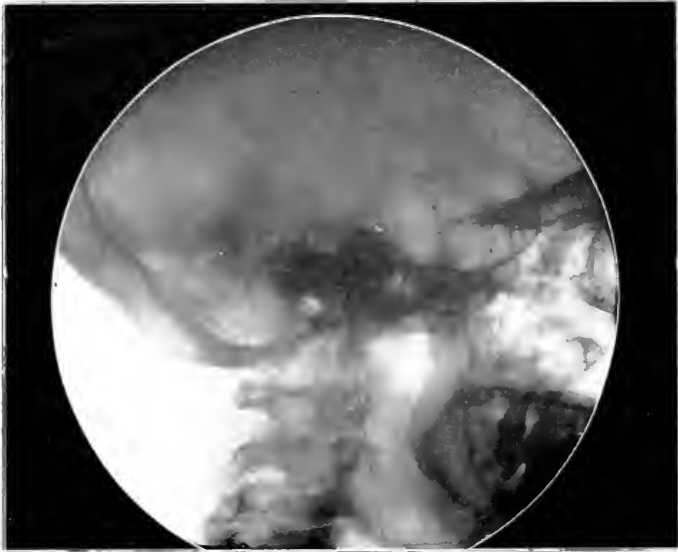
Enlargements of the hypophysis accompanied by symptoms generally came under the notice of the ophthalmologist on account of the ocular signs. Since these evidences of pituitary involvement usually accompany giantism, the occurrence of a heteronymous hemiopia, without acromegaly or myxedema, is worthy of our consideration.

Mrs. K. E. W., age 39, in apparent good health, consulted me July 31, 1907. She came with a letter from Dr. E. Boise and Dr. D. Emmett Welsh, of Grand Rapids, Mich. These gentlemen had made a careful examination of the patient and I am indebted to them, not only for the privilege of seeing the case but for a complete history of her case. There was no indication of lues or of any other general disease except acute articular rheumatism in childhood. The only ancestral eye anomaly I could discover was the fact that her father became blind at 40 years of age and had so remained until his death. The patient does not now complain of any trouble except slight nervousness.

On inquiring into her ocular history she tells me that when 18 years of age she had diphtheria, after which there set in the naso-pharyngeal pareses so common in the early history of the disease. Her vision for near was very decidedly affected at that time, and she also says that she was deaf, speechless and could not walk for over a month. She asserts that since the diphtheria her health has not been robust, although she has had no serious disease. Recovering from the attack she had no ocular discomfort of any sort until a year ago.

Her eye troubles set in about a year ago, with dimness of

vision, noticed especially when she tried to read. She found that there was a sudden disability in that direction beginning with a sense of strain after reading or sewing for a few minutes—always worse at night. After a while she noticed that she could see better by turning her head to one side, or by reading a few words



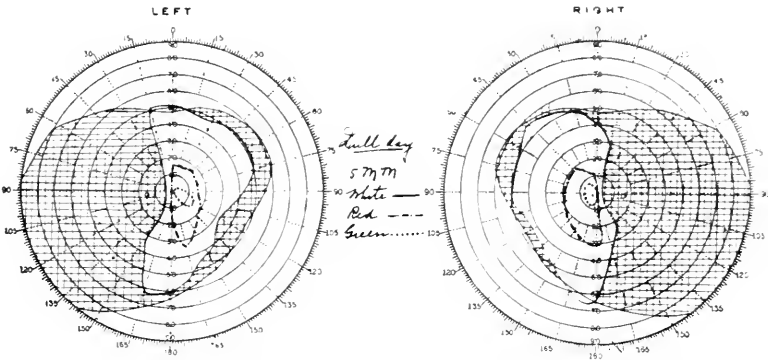
ahead of the place that she desired to see. This trouble she thinks has been getting slowly worse in spite of the fact that her hypermetropia (about 1.25 D.) has been corrected with glasses, which she now wears constantly. The eyes themselves are perfectly quiet, there being no visible congestion of the anterior vessels and the patient does not complain of any discomfort apart from a sense of strain and blurring.

Her vision is 20/100 and words of J. 6 in the left eye; 20/200 and words of J. 10 in the right eye, all eccentrically. The pupillary reactions and the tension are practically normal. The fundus, otherwise normal, shows a diffuse gray-white decoloration on both optic nerves. The central vessels showed no abnormality. The fields of vision for white and colors exhibit a well marked heteronymous hemiopia, with decided, rather regular limitation of the periphery.

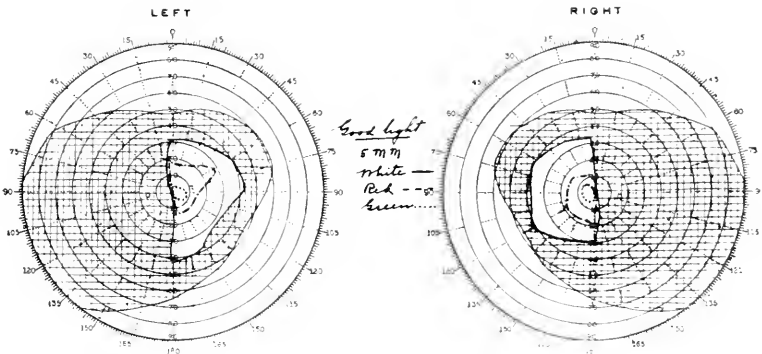
The following additional examinations were made. The nose and other neighboring cavities were carefully examined by Dr. Frank Brawley, and with the exception of hypertrophy of the middle turbinal on both sides, were found to be free of disease. A

blood count showed hemoglobin about 90 per cent, red blood corpuscles, 4,250,000; white blood corpuscles, 9,600. Urinalysis negative.

I also referred the patient to Dr. Archibald Church, who carefully examined her and sent me the following report:



"In reference to Mrs. W., I should say that while the general and physical examination is negative, aside from the ocular condition and the x-ray picture, the patient is in a condition of premature menopause. During the last eight or nine years she has



not menstruated more than once a year. I think she told me she is not yet 40 years of age. Menstruation began at 14 and was regular for a number of years. This may bear a definite relation to the pituitary disease."

It was Dr. Church who suggested that a skiagram be taken, and this was done by my friend, Dr. M. Reichmann, who tells me that there is a very evident enlargement of the *sella tursica* with a faint shadow in the same neighborhood that represents, in his judgment, an enlarged hypophysis. I regret to say that Dr. Reich-

mann was unable to obtain a satisfactory print of the skiagram, although I here present the picture that he furnished me.

I have not emphasized the statement, confirmed by Dr. Church, that the patient exhibited no appearance whatever of myxedema or acromegaly. The field of vision was carefully worked out by one of my assistants, and about a month afterwards by Dr. A. N. Murray, and I submit them to you this evening. The treatment during the month that intervened between these two examinations, as well as previously under Dr. Welsh, was the iodids in large doses, the former carried out in a summer resort removed from all household cares and anxieties.

I have been unable to make a definite diagnosis so far as the character of the tumor is concerned, nor can I account for the apparent improvement which has taken place in the patient's general condition, central vision and visual fields. The improvement of the latter is easily recognized in the accompanying perimeter charts. A fact worthy of note is that her Jaeger is practically the same as at the first examination, namely, words of J. 6 left eye, and J. 12 in her right eye, eccentrically; on the other hand, her distant vision has improved to 20 50 minus, eccentrically, and has remained about the same (20 200) in the right eye. (Literature.)

DIAPHANOSCOPY IN GLAUCOMA.

BY H. V. WURDEMANN, M. D.,

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(Illustrated.)

There has been so much interest taken in this subject and so many calls for reprints of previous articles relating to transillumination of the eye in its various phases that I am constrained to submit a few additional observations.

According to the suggestion made by the chairman, Dr. George C. Savage, at the Boston meeting of the Ophthalmic Section American Medical Association, for the past year and a half I have examined all cases of increased ocular tension that have come under my observation, and in a number of instances other members of the same family, by ocular transillumination, in hopes that this method would throw some light upon the mechanism of glaucoma. In order to show the limitation of transillumination in this affection I will first give a brief resume of my ideas of the subject.

Glaucoma is not a disease per se: it is a condition, the most pronounced symptom of which is excessive intraocular pressure. There are two forms: anterior and posterior glaucoma.

(1) *Anterior glaucoma* may be acute or chronic, primary or secondary. The *primary* kind may be due (a) to increased secretion of the aqueous and increase of albuminous elements from congestion of the ciliary processes—according to Uribe y Troncoso and Leber: (b) sclerosis of the vessels causing obstruction or closure of the iridic filtration angle. *Secondary* glaucoma may arise from previous iridic disease causing obstruction of the filtration apparatus, or due to closure of the posterior chamber from posterior synechiae. These conditions (a and b) are curable or alleviable by myotics or by the operations of iridectomy or sclerotomy.

(2) *Posterior glaucoma*—the chronic simple noninflammatory type—is the second division and is due to obstruction of the

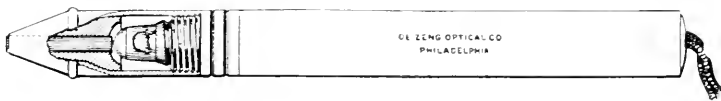


Fig. 1.—Ocular transilluminator (author's model). 2-3 actual size.

vortical veins of the chorioid and diseased blood vessels, and is usually accompanied by general arteriosclerosis. This condition causes excessive pressure in the vitreous chamber and is mostly confined thereto. This form is not materially affected by any local treatment, be it myotics or operations, with the possible exception of high tension faradic and galvanic electricity and ocular massage, with treatment directed toward toning up the general circulation.

A mixed type is due (a) to intraocular tumors, which from their growth and consequent intraocular pressure produce obstruction of the anterior and posterior drainage apparatus: (b) so-called hemorrhagic glaucoma, usually due to subchorioid hemorrhage which produces the same, and for these two conditions enucleation is the only resort: (c) increased intraocular tension following injury to the lens which causes it to swell and press upon the anterior filtration apparatus, obliterating the circumferential space and increasing the amount of albumin in the aqueous. Operations of iridectomy and removal of the lens are the usual recourse for this condition.

In the anterior types (I) the diagnosis is assisted by transillumination. The diaphanoscope is best applied to the sclera at

the outer canthus after application of 2 per cent alypin or 5 per cent cocaine, although the light may be passed through the lids for superficial examination. The pupil is thereby lighted up and if the eye be looked at obliquely the ciliary body will appear as a dark ring, being most pronounced on the opposite side—the circumlental space as a clear ring at the root of the iris between the rounded margin of the lens and the ciliary processes. This is usually from 3 to 4 mm. wide. If the lens' diameter be increased or if it be further forward than normal, or if the ciliary processes be thickened by congestion, this space is encroached upon and may be obliterated. The circumlental space is enlarged during accommodation. In this observation I am particularly pleased to corroborate the findings of Professor Hess.¹

Anatomical conditions, as a narrow circumlental space, predispose toward increased ocular tension, and individuals of families

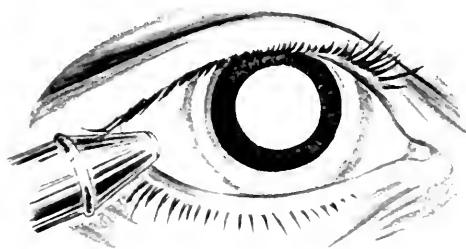


FIG. 2.

DIAPHANOSCOPY OF THE EYE, SHOWING THE CIRCUMLENTAL SPACE.

The pupil is moderately dilated, the root of the iris shows as a dark ring around the limbus, then a clear ring is seen, which is the circumlental space, surrounded by another dark ring caused by the shadow of the ciliary processes; outside of this ring the sclera is brilliantly illuminated. In the drawing the differences in illumination are slightly emphasized and the lighting of both sides of the globes are equalized. In practice the conditions are best observed on the opposite side to that which the tip of the transilluminator is applied. The drawing is semi-diagrammatic.

who are prone to anterior glaucoma will most of them be found to have a narrow circumlental space. In this finding I have many times corroborated Dr. Tenney's observations.² Such cases, however, do not have any increased tension except after the onset of conditions which cause glaucoma, but in them a small degree of swelling or congestion of the root of the iris or the ciliary processes tends to block up the space around the lens and thus interfere with drainage from the posterior to the anterior chamber and the filtra-

¹ Hess, C., "Modern Views of the Physiology and Pathology of Accommodation," *Transactions Soc. on Ophth., Amer. Med. Assoc.*, 1907.

² Tenney, J. A., "Relation of the circumlental space to the causation of glaucoma as shown by the Wurde mann Lamp," *Transactions, Soc. on Ophth., Amer. Med. Assoc.*, 1907. See also author's discussion of above paper.

tion at the iridic angle. Traumatic cataract causes much the same conditions.

In *posterior glaucoma* (11), unless the anterior chamber becomes smaller—and this is by no means always the case in the chronic simple noninflammatory type—diaphanoscopy is negative.

In glaucoma produced by intraocular tumors the shadow of the tumor may be seen, and if the anterior chamber be affected the conditions above described will also be readily demonstrated.

Thus the lighting up of the eye by diaphanoscopy gives us some idea of the mechanism of glaucoma and the anatomical conditions that predispose to this affection. We clearly see that the anterior chamber is smaller, that the lens is further forward, and that the iridic angle and circumlental space are encroached upon.

Diaphanoscopy of the eye is a valuable corroborative method of examination in glaucoma.

A CASE OF NON-VASCULAR PARENCHYMATOUS KERATITIS, RECENT VIEWS OF ITS PATHOLOGY.

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DENVER, COLO.

The sources of our knowledge of the nature of parenchymatous keratitis have been three-fold: clinical, experimental, and anatomical. Clinically it is not difficult to recognize a parenchymatous change in the corneal tissues, and fortunately we are generally able to treat it successfully. Yet the local treatment at least, is largely empirical and we have no clear conception of the nature of the pathological changes taking place.

In 1905 at the Ophthalmological Congress in Heidelberg it was the subject of discussion, whether there could be a non-vascular type of parenchymatous keratitis. This question which reveals the uncertainty and incompleteness of even our own clinical ideas, is but secondary to the fundamental question, whether parenchymatous keratitis is a primary disease, or is always secondary to diseases of the uveal tract. The latter view is the one taught in most text-books. In order to settle these two questions it is necessary that we have more clinical and histological reports than are now at hand. I append to this article the report of a case of parenchymatous keratitis which is both non-vascular and primary. Elschnig has also reported two non-vascular, primary cases. These three cases are all I have been able to discover.

Experimentally, Leber, Wagenmann and others have produced conditions resembling parenchymatous keratitis. Parsons

comments upon the data thus gained, as follows: "None of the experiments can be regarded as affording typical examples of the clinical form of interstitial keratitis, the immediate cause of which is yet to seek."

Anatomical researches have been made in a number of instances by good observers. Elschnig's criticism of all these cases coincides exactly with the following from Parsons: "The cases of true interstitial keratitis, in the restricted clinical sense, which have been examined microscopically are very few, and are mostly complicated by other conditions, which make it difficult to determine the exact anatomy of the disease. Even amongst the cases examined a large proportion of those described as parenchymatous were undoubtedly tubercular. This raises the question of the true etiology of the disease. In England we are accustomed to regard the typical condition as of syphilitic origin, and no satisfactory proof has been brought forward that this view is incorrect."

Anatomy and experiment have not availed to settle the question whether the disease is primary or secondary. As has been said, most authorities believe the disease to be secondary, but whether we consider a previous injury to the endothelium of the cornea, or a fore-running uvea-scleral inflammation as essential, we find ourselves at variance with clinical experience, which teaches that this disease appears in what have been, hitherto, normal eyes. Let us see what Elschnig has contributed toward the settlement of this vexed question. I Graefe's Arch. and Ophthalmol. Vol. LXII Hft. 3.

In addition to the two clinical reports of cases of non-vascular, primary parenchymatous keratitis, Elschnig has examined microscopically the two eyes from a patient who, in life, suffered from this disease in the early stages. The case was of luetic origin. Translated and condensed, Elschnig's ideas are about as follows:

"Although we cannot observe the genesis and sequence of the different corneal changes one after the other on the same preparation, we can do so by comparing the two corneas. The fixed corneal corpuscles undergo a multiple subdivision so that, in the somewhat widened spaces, numerous irregularly-formed nuclei are to be seen which certainly are to be considered as the offspring of the fixed corneal corpuscles. Nuclei of migratory cells and leucocytes with polymorphous nuclei are also to be seen, and these also have their origin probably in the cellular elements normally present in the cornea. The lymph spaces are widened and

filled with a mass containing small nuclei, staining light blue with haematoxylin. The products of disintegration swell, the lamellae dissolve between the corneal cells and the cells themselves die.

Restitution of the decayed portion of the cornea takes place in two ways: In the beginning in the smaller, centrally situated foci, it is brought about exclusively by proliferation of the fixed corneal corpuscles in the neighborhood of the focus. The cells grow into the necrotic portion or perhaps migrate thither. It may be assumed that the proliferated corpuscles have the property of locomotion and this assumption is borne out by the multiplicity of forms and the variable position of the nuclei in the restitution foci. The necrotic tissue is replaced by a convolution of cellular masses which have only a small amount of intervening substance. These cellular masses gradually assume a more regular order and form, and between the cells some interstitial tissue appears which still is to be distinguished from the lamellae by the staining.

In many places the repair goes on with the co-operation of blood vessels of new formation. In the most superficial places these spring from the anterior ciliary and episcleral vessels in the form of an artificial pannus, having for its cause, apparently, the necrotic and repair foci just under the membrane of Bowman. In these places, just as in ulceration of the cornea, the membrane of Bowman is defective. In general the blood vessels were in the outer third of the corneal thickness.

In the central part of the cornea they branch and pierce the whole thickness of the cornea. Even in the vascularized portions the repair goes on exclusively by proliferation of the normal corneal elements: never is there to be seen any proliferation of connective tissue on the walls of the newly formed blood vessels. These vessels are very thin-walled, or consist only of an endothelial tube, and, even on the longer affected eye, are free from any covering of connective tissue. Extensive formation of fibrous tissue ensues only in case of extensive necrosis and where there is a deficient capacity for proliferation on the part of the remaining corneal corpuscles. True scars thus result, which of course cannot be made transparent.

Concerning the causes of the changes in the cornea, it can be stated with absolute certainty on the ground of the anatomical discoveries that the corneal changes are to be regarded as primary. The inflammatory changes in the uvea are so insignificant, especially in the longer affected eye, that it is inadmissible to speak

of the corneal disease as secondary, or indeed, even as an accompaniment of uveal disease."

Parenchymatous keratitis belongs to the group of degenerative diseases. The necrosis is doubtless due to disturbances in the nutrition, or damage to the cellular elements following pathological changes in the fluids of nutrition. We may assume that toxins in the blood pass into the fluids of the cornea, and exert first a nutritive irritation upon the corneal corpuscles: that then the cellular elements, stimulated to an active division, acquire an abnormally weak power of resistance and break down.

Migration of cellular elements from the ciliary vessels plays no part, except where an extensive necrosis causes an inflammatory reaction upon the vessels.

From the seat of the focus of necrosis, as well as of the repair focus later occupying its place, it can be absolutely excluded that the corneal disease could have arisen from penetration of normal aqueous humor, or of aqueous containing toxins. The endothelial theory requires the principal focus of the corneal disease to be situated in the layers of the cornea bordering on the anterior chamber and that the first changes be a glassy appearance, due to penetration of the aqueous and swelling of the corneal lamellæ. Neither of these phenomena is present. The pretended analogy of the experimentally-produced keratitis and true parenchymatous keratitis could exist only so long as no case of true parenchymatous keratitis had been examined microscopically. Most of the cases which have been examined were tubercular and in these cases the pathological changes were in the *posterior layers of the cornea*.

Tubercular keratitis presents a very different picture from true parenchymatous keratitis. In the latter the anatomical findings are peculiar, just as the clinical course is peculiar. Although in some particulars the same histological appearances occur in widely different corneal diseases, such as proliferation of the fixed corpuscles and new formation of blood vessels, yet the intensity, course, especially the high-grade of atrophy of the epithelium and necrosis of the lamellæ are not observed in any form of keratitis except the true parenchymatous of syphilitic origin.

The patient, T. G., colored, aged 19 years, appeared on March 31, 1906, complaining of a blur when he attempted to read. No other symptoms could be elicited. The vision in the right eye was 5/5 = 1; in the left eye it was 5/5.

The cornea in the left eye showed a nebulous opacity 2x1 mm. in extent, in the superior temporal quadrant. On magnifying the opacity was seen to consist of numerous islands or foci,

situated in the substantia propria, and resembling snow flakes in clear ice. Two or three feet were also to be seen near the inferior border of the cornea. Blood vessels of new formation were absent from the cornea; there was neither conjunctival nor ciliary redness.

Homatropine was instilled. The pupils did not dilate widely. The fundus was found to be normal. At this time, March 31st, the cornea of the right eye was clear and its fundus normal. The upper incisor teeth show the typical notching. The family history is negative.

After three weeks there appeared in the cornea of the right eye, at first below, then at the temporal side, a series of foci advancing towards the center. The subsequent history of the two eyes is essentially the same; the infiltration became more and more diffuse with time.

In the course of a few weeks the opacity in each eye had crossed the pupil leaving clear cornea behind at the temporal side. The vision of the left eye on June 25th was $5/10$, which was the lowest vision reached by this eye. The lowest vision recorded for the right eye was $9/10$, and the patient attended to his work of running an elevator every day. On August 6th the vision in the left eye was $6/5$ and the cornea had become clear. By this time the cornea of the right eye had also cleared and the vision was again normal.

There was never at any time, any iritis, ciliary or conjunctival redness or blood vessels of new formation.

The treatment consisted of inunctions of mercury and potassium iodid, with, locally, a placebo. Atropine was not found necessary. Examination by the corneal microscope showed the foci to be situated in the anterior layers of the corneal parenchyma. Every attempt to stain the epithelium with fluoresceine was unsuccessful.

PARACENTESIS OF THE ANTERIOR CHAMBER IN INFLAMMATORY PROCESSES OF THE UVEAL TRACT.

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Ophthalmic Surgeon, German Hospital.

NEW YORK.

During the last three years I have performed paracentesis of the anterior chamber in cases of iritis, iridocyclitis, cyclitis, interstitial keratitis, chorio-retinitis and in one case of diabetic neuroretinitis.

As the result of the treatment of about 12 cases I think that

paracentesis of the anterior chamber—performed, if necessary, twice a week—has in many cases a favorable influence upon inflammatory processes of the uveal tract. As a rule the violence of the pain becomes less, the duration of the inflammation shorter and the clearing up of the vitreous more rapid.

I did not publish my experiences, as I thought that four or five cases would not prove much, and so it happened that Nieden, at the 1906 meeting of the Heidelberg Ophthalmological Society, read a paper on the same subject. He had made paracentesis for iritis only, while I instituted this kind of treatment—beginning in October, 1904—for all kinds of inflammatory processes of the uveal tract.

Amongst my cases there were four of interstitial keratitis in young people—between 13 and 22 years of age—three of iritis—two of specific and one of tubercular origin in young men of 26, 31 and 34 years—two of chorioretinitis with vitreous opacities (etiology?) in a man of 37 and a woman of 28, one case of cyclitis after the removal of the lens and one case of diabetic neuroretinitis.

This last case, as seen, does not belong to the class of patients suffering from inflammations of the uveal tract. The vision had gone down to 20/400 in the right eye, and to counting fingers at a distance of about 3 feet in the left. The paracentesis was made twice in an interval of about two weeks, as there was a decided improvement of vision after the first operation. Whether this was due to the general treatment I shall leave undecided.

In the cases of iritis the paracentesis was performed on account of violent pain and of narrow pupil in spite of atropin, and in the four cases of interstitial keratitis on account of dense opacities of the cornea.

In the majority of my cases the paracentesis was followed by an improvement of the condition of the diseased eye; in a few there was no apparent change, except that, as a rule, the pain became less violent for some time and in one case the tubercular process could not be arrested and the eyeball had to be removed.

The operation was performed in a number of cases in my office, in some in the hospital; it was repeated twice a week—sometimes for a period of three weeks—in one case one paracentesis only was made.

In performing the operation a sharp, narrow keratome should be introduced through the limbus—in two cases I used a Graefe knife. The instrument should be withdrawn very slowly, giving

the aqueous a chance to escape. I always wait then a few minutes, until the anterior chamber had been restored to open the wound again once or twice more with the keratome. On account of pain of the inflamed eyeball I make a subconjunctival injection of cocaine. In a few cases I used gas.

I like to mention that in some cases I syringed the anterior chamber with normal salt solution, but I have given it up lately.

Amongst the complications, I saw twice the iris slightly moving towards the wound, which can easily be overcome by the keratome, and occasionally a small hemorrhage.

ARGYROSIS DUE TO THE USE OF ARGYROL.

FREDERICK KRAUSS, M. D.

Ophthalmic and Aural Surgeon to St. Christopher's Hospital, Philadelphia.

The extensive use of argyrol in the treatment of diseases of the conjunctiva and lachrymal apparatus, and the lack of irritation following its use, makes it of interest to report any unusual or undesired action following its employment.

In the past years silver nitrate was the favorite drug in conjunctival inflammations, as it is still in many cases. It was however, generally used by the physician, and carefully neutralized. Its tendency to cause argyrosis after prolonged use was recognized, and it was used intermittently. Rarely was it prescribed to be used by the patient, as even weak solutions caused argyrosis, after prolonged use.

The advent of the albuminous salts of silver, and especially in this country of argyrol, has caused us to allow the patient to use these salts at home, and often with benefit.

It is stated by Bruns (*OPHTHALMIC RECORD*, Dec., 1906) that he has never seen argyrosis follow the use of argyrol.

Sydney Stephenson (*Medical Press*, Dec. 21, 1904) states that "it has been claimed that argyrol never stains the conjunctiva, no matter in what concentration or for how long it may be applied."

Darier states that "one can without fear entrust its application to the patient or to those who look after him."

The following case of argyrosis shows the necessity of warning our patients of the results of indiscriminate and prolonged use of argyrol and similar salts of silver.

Mamie D. C., aged 4 years, entered the Eye Dispensary at the Howard Hospital October 19, 1904, suffering from dacryocystitis in the right eye, which had become purulent after a period of two months. The patient returned in December, when Bowman's

operation was performed by Dr. W. C. Posey. In spite of this the purulent secretion in the lachrymal sac continued.

On January 31, 1906, Argyrol in 20 per cent solution was prescribed for home use of the patient, one drop to be instilled twice daily. Under its influence, associated with cleansing boric acid lotions, the secretion lost its purulent character and became mucoid.

The patient did not report from March, 1907, until October 18, 1907, when a condition of marked argyrosis had developed in the right or affected eye. The bulbar conjunctiva had a marked blue-green tint, which assumed a deep bluish green tinge in the inferior conjunctival cul-de-sac and about the lachrymal caruncle. The palpebral conjunctiva of the lower lid was also slightly tinted, while that of the upper lid was apparently free from discoloration. The argyrol solution was at once discontinued, and the patient placed upon small doses of iodide of potassium.

In this case, therefore, argyrol was used for a period of 20½ months in one drop doses of a 20 per cent solution. Had he not been compelled to return to the hospital for a renewal of his eye solutions, he would have continued indefinitely in its use with perhaps intense argyrosis resulting. The discoloration has greatly diminished since the discontinuance of the use of argyrol.

Two years ago, Dr. Zentmayer exhibited for Dr. Posey before the Section a case of argyrosis, which occurred in a young man the subject of trachoma, who had been using, without being so instructed, a 25 per cent solution of argyrol daily for four months. The staining of the palpebral and bulbar conjunctiva was quite pronounced, but I am told by Dr. Posey that he has recently seen the case, and that the discoloration gradually subsided after the discontinuance of the silver preparation, until the conjunctiva has now almost entirely lost the brownish stain.

I am indebted to Dr. Posey for the privilege of reporting this case.

Patient exhibited at the Section of Ophthalmology, College of Physicians, Philadelphia.

OCULAR PARALYSES AND THEIR DIAGNOSIS: A CLINICAL METHOD FOR STUDENTS.

ELLICE M. ALGER, M. D.,

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The subject of the differential diagnosis in cases of paralysis of ocular muscles has always been one which greatly confused

the student. Every one must admit that cases involving several muscles or complicated by previous heterophoria or by secondary contractions may puzzle the most expert, but the routine procedure is so complicated that the student, confused by his efforts to remember the various actions of the twelve extrinsic muscles and the various forms of diplopia caused by their involvement often cannot make a diagnosis of the simplest case without a reference to his page of plates showing the variety of diplopia said to be characteristic of each.

This confusion is in large part due to our efforts to make our clinical methods follow too slavishly the teachings of physiology which are, after all, largely theoretical, being so far as the eye muscles are concerned chiefly deduced from the working of mechanical models.

We are taught, for instance, that the superior rectus not only turns the eye up but by virtue of its course and insertion has two secondary actions: first, that of aiding the action of the internus, and second, of causing a certain torsion or wheel motion of the eye. Theoretically, then, a paralysis of a superior rectus should not only allow the eye to sag down but also to turn slightly outward, while its vertical meridian would be slightly tipped. We are therefore taught that in a paralysis of the right superior the image seen by this eye seems higher and further to the left than it really is, and that it is more or less tipped. From a clinical standpoint, however, we know that a large percentage of our patients have an exophoria or an esophoria, which, if present, would completely nullify the significance of any slight lateral diplopia. The tipping of the false image, too, is a matter of pure theory and rarely seen in practice: when it might be due to a pre-existent cyclophoria or even to suggestion. The same discrepancy between the theory and practice can be found in studying paralysis of the inferior rectus.

We are taught by the physiologists that the oblique muscles not only keep the vertical planes of the two eyes parallel, but that they also, acting together, aid in turning the eye outward, and singly, upward or downward as the case may be. Theoretically, then, in paralysis of a right superior oblique the eye should not only incline its vertical plane outward but should also turn slightly in and up, the image formed seeming not only tipped but below and to the right of that formed in the other eye. Clinically, however, paralysis of an oblique muscle is a great rarity and the more experienced the observer the fewer cases he sees that are beyond

question. The lateral diplopia, if present, may be homonymous or crossed, according to the existence of a previous exophoria or esophoria, which we must always suspect but can never prove unless we have the previous record of our patient. Likewise, the position of the false image may be raised or lowered by a previous right or left hyperphoria.

If we are to make any certain progress in our diagnosis of these conditions, we must cease to lay so much stress on the purely theoretical and depend more on reasonings which are capable of clinical demonstration. We know that the chief function of the oblique muscles is to cause a rotary motion of the eyes and so keep the vertical meridians of the two parallel. When one of them is paralyzed there may or may not be vertical or lateral displacement of the images but there must be a tipping of all vertical objects seen with the affected eye and this tipping will be marked. Without it there can be no certain diagnosis of an oblique paralysis. A slight tipping of the image is not of the same value, for it may be accounted for by a preëxistent non-paralytic insufficiency of an oblique which, according to Stevens, is very common.

If we cause the patient to look at a pencil held directly in front of him, it matters not whether the double images are homonymous or crossed or one above the other; so long as they seem parallel we may absolutely exclude an oblique paralysis. If, however, one of them be distinctly out of plumb we can readily tell by interposing a card which eye has the tilted image, and if we tip the pencil till it seems vertical to the patient its direction must correspond to the position of what was the vertical meridian of the eye before the paralysis. If this meridian is now tipped outward, it must be due to an undue relaxation of the superior oblique, if inward, of the inferior oblique.

The same thing will be observed if a maddox rod be placed before the eyes alternately with its axis horizontal. The sound eye will be conscious of a vertical band of light in looking at a candle flame while in the paralyzed one it will be slanting until the rod is rotated in the trial frame so as to lie at right angles to the true vertical meridian, when the line of light will again appear vertical. Knowing the position of the true vertical meridian, it is an easy matter to decide whether it has been tipped outward by paralysis of a superior or inward by that of an inferior. Having excluded by one of the above tests paralysis of an oblique, we have simplified our problem materially and can proceed to the examination of the eight straight muscles. The paralysis of one

of these, even if very slight, causes a diplopia when the object of regard is straight in front, but a similar diplopia may occur as the result of heterophoria of some sort. When, however, the eyes are turned in a direction which calls into action the affected muscles, the eye lags behind and the separation of images becomes greater and greater, while in heterophoria the increase is not very great, if present at all. Let us suppose a paralysis of the right externus. In the primary position there may be a decided lateral diplopia or it may be very slight. When, however, we move the object of regard to the right, the patient's right eye in trying to follow it lags behind and the image, instead of being formed at the macula, falls on the inner half of the retina and gives the impression of being farther to the right than it really is.

It is customary here to stop and determine whether the diplopia is crossed or homonymous, but it is not necessary; it is enough to know which eye has the false image and when, of course, the only muscle of that eye which is being employed must be the one at fault. This is easily determined by placing a red glass before one eye when the patient at once sees a red and a white light side by side the image in the right eye seeming furthest to the right and separating further and further as the eyes are turned in that direction. But a paralysis of the left internus also causes a lateral diplopia, which also increases as the eyes are turned to the right. In this case, however, the left eye lags behind the image is formed on the outer half of the left retina and seems further to the right than it really is. In either case the false image is to the right. To be sure the diplopia is in one case homonymous and in the other crossed, but this is a matter of academic interest only, the important point being that a lateral diplopia, increasing as the eyes are turned to the right, indicates a paralysis of the right hand muscle of the eye having the right hand image. Similarly a lateral diplopia increasing eyes left always indicates a paralysis of the left hand muscle of the eye having the left hand image.

The same principle can be applied to vertical diplopias after the obliques have been excluded. Let us suppose a paralysis of the right superior rectus. This will cause in the primary position a vertical diplopia which is theoretically crossed and with the false image slightly tipped. But we have already seen that if there was a preëxistent esophoria, the diplopia may be homonymous, while the tipping is seldom seen and may then be due to suggestion or to a preëxistent cyclophoria. From the diagnosti-

point they may be dismissed as interesting, but not important. If, however, we compel the patient to turn his eyes upward, either by raising the candle or tipping his head, the right eye lags in proportion to the amount of paralysis, the image is formed on the lower half of the retina and the candle seems higher than it really is, while the further the eyes are turned upward the greater the vertical separation. The same reasoning holds true of the left superior. Therefore a vertical diplopia which increases markedly eyes up must be due to the inaction of the superior muscle of the eye having the superior image, which we can readily identify with a piece of red glass.

If an inferior rectus is paralyzed, the affected eye lags when the gaze is directed downward and the diplopia is still vertical, but the image in the paralyzed eye being formed above the macula seems lower than its fellow. Therefore a vertical diplopia increasing eyes down must be due to a paralysis of the inferior muscle of the eye having the inferior image.

The same method can be applied to cases in which several muscles have been paralyzed simultaneously. In examining the lateral muscles, the amount of vertical diplopia should be entirely disregarded and vice-versa, while it must always be borne in mind that a diplopia which does not increase when the candle is carried in the direction of the suspected muscle is no indication of paralysis of that muscle.

55 EAST FIFTY-SIXTH STREET.

SIX CASES OF PHLYCTENULAR CONJUNCTIVITIS ASSOCIATED WITH DIPLO-BACILLARY CONJUNCTIVITIS.

By HANFORD McKEE, B. A., M. D.,

Assistant Surgeon to the Eye and Ear Department of the Montreal General Hospital,
Oculist to the Montreal Maternity Hospital, and Assistant Demonstrator
in Ophthalmology, McGill University.

(From the Pathological Laboratory of the Montreal General Hospital.)

Ophthalmologists who have practised bacteriological methods in conjunctival diseases have been struck with the almost constant negative results found in cases of phlyctenular conjunctivitis. I do not propose in this note to go into the reported positive results, such a phlyctenular conjunctivitis caused by staphylococci. To my mind it is just as sound to attribute many cases of conjunctivitis to the bacillus zerosis because this micro-organism is very often found in the inflamed conjunctival sac, as it is to

put phlyctenular conjunctivitis due to the staphylococci because the latter have been isolated from some cases.

I have examined many cases of phlyctenular conjunctivitis with negative results, and my object in reporting these cases is to encourage further examination, believing the results will at times repay the clinician for his trouble.

On April 3rd, 1906, E. W., an adult male, was referred to me in private, complaining that for four days his left eye had been sore and very painful. The eye showed marked congestion of the palpebral conjunctiva: at the outer corneo-sclerotic margin was seen a small greyish elevation surrounded by an area of conjunctival hyperemia,—a typical phlyctenule. A little conjunctival secretion was taken from the inner canthus, smeared well over a glass slide, and stained. To my surprise the field was covered with diplo-bacilli.

Further examination showed a like infection of the right eye and on questioning the patient it was found that he had suffered at intervals from sore eyes. The left eye was now well flushed out with some weak solution of the sulphate of zinc and drops of the same solution were prescribed for the patient to use freely four or five times a day.

Three days later he returned very much improved, there was no further pain, and he had slept well. The eye looked better and the phlyctenule and surrounding hyperemia had almost disappeared. Two days later the bulbar conjunctiva was quite normal. He was cautioned to continue the treatment for two weeks and at the end of that time he reported to me when the conjunctivæ were quite normal.

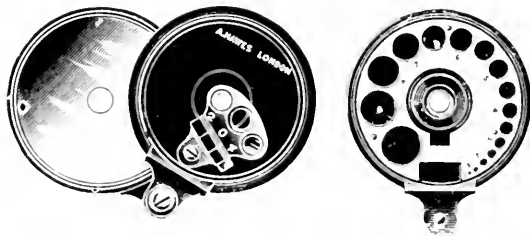
Within a year I have seen six such cases, that is, six cases of phlyctenular conjunctivitis where diplo-bacilli were found in the conjunctival sac. Axenfeld, in describing the clinical picture of diplo-bacillary conjunctivitis mentions that phlyctenules are sometimes found, especially in scrofulous children. This condition I have at times seen and quite understand. Here the phlyctenular condition occurs during the course of a diplo-bacillary conjunctivitis and secondary to that. The six cases here reported were very different. They were all healthy young adults. The phlyctenular condition was what stood out prominently and was what the patients came to consultation for. That they were subjects too of diplo-bacillary conjunctivitis was only found out by following routine methods. I do not wish to be understood as believing these cases of phlyctenular conjunctivitis were caused

by diplo-bacillary infection. Whether phlyctenular disease of the conjunctiva is due to bacterial infection or not is questionable. These cases are reported to show that even in phlyctenular conjunctivitis it is worth while to examine the conjunctival secretion. Where it is found there is an associated diplo-bacillary infection, your cure, by using freely a weak solution of the sulphate of zinc, will be quick and sure, a course by no means constant in cases of phlyctenular conjunctivitis.

AN IMPROVED RETINOSCOPICAL MIRROR.

BY A. ALISON BRADBURN, F. R. C. S., EDINBURGH.
SOUTHPORT.

From the illustration it will be seen that two mirrors (one concave and one flat), 13 $\frac{1}{4}$ inches in diameter, are hinged together so as mutually to protect one another. This is a well-known device, but the improvement consists in having on the back of the concave mirror a small triangular carrier. This has three perforations carrying a + 2 D. and a + 1 D. lens, the center one being unglassed. When examining by the indirect method either at will



can be brought over the sight hole of the mirror. The advantage of examining with + lenses gives not only increased magnification but lessens the distance at which the observer has to stand from the eye of the patient. To enable one to clean the lenses the carrier is hinged on itself. The sight holes in both mirrors are six millimeters in diameter, which is larger than commonly made. Messrs. Hawes of Leadenhall street, London, E. C., made the instrument at my suggestion some years ago, and as it has proved of value to myself and recommended itself to other ophthalmic surgeons it may be worth the attention of others. A pupilometer is fitted to the back of the flat mirror.

ON THE POSSIBLE USE OF ATOXYL AND OTHER
PREPARATIONS OF ARSENIC IN SYMPATHETIC
OPHTHALMIA, TRACHOMA AND SOME SYPHILITIC
AFFECTIONS OF THE EYE. A
SUGGESTION.

H. GIFFORD,

OMAHA, NEBR.

The combination of arsenic and anilin known as atoxyl deserves more attention from ophthalmologists than it has hitherto received. (1) It has proved to be nearly a specific for the diseases caused by trypanosomes, and in the war against their near relations, the spirochaetes it is also very effective. Introduced in the treatment of the sleeping sickness by Thomas of the Liverpool School of Tropical Medicine, and used later with brilliant results by Koch² in the same disease: its efficiency against dourine or *mal du coil* (caused by *Trypanosoma equiperdum*) as well as the spirillosis of fowls was demonstrated by Uhlenhuth, Gross and Bickel,³ who also suggested that it should be tried in surra, nagana, mal de Caderas, relapsing fever, syphilis, malaria: in short, in any disease caused by a protozoon rather than by a bacterium. In the treatment of syphilis, its value, since the introduction of large doses by Salmon, has been abundantly proved, both clinically and by the experimental work of Uhlenhuth and his assistants⁴ and by Neisser.⁵ It has also been used with success in malaria by Grosch,⁶ although Koch does not think that it affects the malaria germ.

This apparent affinity of atoxyl for the pathogenic protozoa has led me to try it in a case of sympathetic ophthalmia. Of course we do not know that sympathetic ophthalmia is caused by a protozoon, but we do know, with practical certainty, that it is caused by some germ which does not grow upon the ordinary culture media and which is either too small or too much like the tissue cells to have been detected by the microscope: hence the guess that it may belong to the animal rather than the vegetable kingdom can not be considered far-fetched.

I have tried the atoxyl in only two cases of this sort. One is a recent case which is improving rapidly on the atoxyl and the salicylate, the other was that of a seven year old boy who was brought to me with well-marked sympathetic ophthalmia of a week's standing, following a pitch-fork wound of the left eye. Enucleation, salicylate, mercurial inunction, and atropin produced

decided improvement at first, but the salicylate in doses of 45 grains a day made the boy delirious and I thought best to stop it for a time. Promptly, in spite of the free use of mercury, the inflammation got much worse and was only partially controlled by 30 grains of salicylate a day. Under these conditions I determined to try the atoxyl and gave him 30 minims of a 10 per cent solution injected subcutaneously, at first twice a week, then every other day till 48 grains in all had been given. The inflammation showed a prompt and apparently permanent improvement. The redness disappeared entirely and although there are extensive peripheral synechiae with a film of exudate in the pupillary area it seems altogether likely that the eye is past the danger of relapses and will retain useful sight. Unfortunately this test of the therapeutic power of the atoxyl is vitiated by the fact that about the same time that its use was commenced, the salicylate in large doses was tried again and as this time they were well borne and were continued, it is impossible to draw any valid conclusion as to the part played by the atoxyl. Nevertheless, as it can be given without interfering with either the salicylate or the mercury, I think it is worth trying in addition, wherever a severe sympathetic ophthalmia fails to yield to them at once.⁷

With regard to its use in syphilis, while the experimental work of Uhlenhuth, Neisser, and their coadjutors can leave no doubt as to its specific antagonism to the spirochaete, German syphilologists are less enthusiastic about it than the French. They hold that while it is undoubtedly of use and in some cases succeeds when mercury fails, it can not compete with the latter as a remedy of choice. In the more active ocular manifestations of syphilis I have always got such good results from mercurial inunctions that I have not tried the atoxyl, but in interstitial keratitis, which recent work indicates to be a true syphilitic infection and not merely a parasyphilitic degeneration? the results of all medication are so far from brilliant that I have felt that it was my duty to add atoxyl to the other standard remedies. In the two cases in which I have tried it it has seemed to do good but not in so pronounced a way that the experiment was at all conclusive, but for the immediate future I intend using it along with mercury, iodide, salicylate, and atropine.

With regard to trachoma, while it cannot as yet be said to be of protozoic origin, the *a priori* considerations which apply to sympathetic ophthalmia apply equally well here; to say nothing of the positive results of Halberstaedter and Prowacek, and of

Greef, who have found in trachoma products minute bodies which they think belong most probably to the protozoa. With this in view, the suggestion that atoxyl be tried in trachoma, internally, by direct application, or by subconjunctival injections may be worth considering.

I have written only of atoxyl, but it should be borne in mind that although it is in this combination that arsenic has been chiefly used as a germicide, a difference of opinion is arising as to whether the atoxyl really has any advantage over the older combinations of the drug. Rosenthal and Lassar⁹ prefer arsenious acid in the treatment of syphilis and Loeffler and Russ¹⁰ have found a neutralized solution of arsenious acid, given either by the mouth or subcutaneously, to be decidedly more effective than atoxyl against the trypanosome of the tse-tse disease. Against atoxyl it is also objected that the large doses sometimes cause bad symptoms, apparently from a cumulative action. In European countries, at least three of partial blindness have been attributed to its use; but in two of these the effect was plainly due to an overdose. Krüdenner's¹¹ patient took 50 grams in seven months; while in Bornemann's¹² case, 27 grams were given in a comparatively short time. In the third case a patient of Lesser¹³ received only 5.1 grams in twenty-six days and had vision reduced to 1/6 and 1/10 but the fundus seems to have been normal and there was grave doubt as to whether atoxyl or hysteria was the cause of the amblyopia. But the most astounding evidence of the danger of large doses of the drug is given by Koch¹⁴ in the second part of his report on the sleeping sickness. Finding that in some of the negroes treated with 1/2 gram injections of atoxyl relapses of the sickness occurred, he attempted to get more permanent results by giving one gram at a dose; but twenty-two of the patients thus treated went permanently blind. On the other hand, in several hundred negroes treated for months with a half gram dose two days in succession every twelve days, no trouble with the sight was observed. All of which simply reminds us that atoxyl is a powerful poison, to be used with care. That in such large doses it could affect the sight might have been expected from the fact that in several cases cited by Ulthoff,¹⁵ the older preparations of arsenic have also been known to cause optic neuritis. With regard to the method of giving atoxyl, authorities agree substantially in giving injections of about 15 minims of a 10 per cent solution every two or three days; but they vary considerably as to the number of injections that should be given.

ADDENDUM.

In one case of sympathetic ophthalmia referred to above the salicylate was stopped after a few days and the atoxyl alone given. The improvement in the sympathetic ophthalmia continued and he has now gone for several weeks without a sign of a relapse. The atoxyl also has apparently produced an unusually favorable result in a case of interstitial peratitis in a child of hereditary syphilis.

Hallopeau gives only 3.5 grammes in a single course and then waits fourteen days before beginning again. Others give as high as 9.5 grammes in one course. There seems to be no doubt that it can not be given as effectively by the mouth.

The fact that so far as I can learn, all the cases of blindness from atoxyl have been reported by Germans, although in the treatment of syphilis it has been used even more extensively by the French, indicates that Hallopeau may be correct in saying that the German and the French preparations are not identical and that if the French atoxyl can be procured it should be preferred.

1. The only reference to the use of atoxyl in eye diseases which I have come across is given by Wehrmann, *Abst. in Centralblatt f. Augenheilk.*, p. 288.

2. *Deutsche Med. Woch.*, 1906, 51.

3. *Deutsche Med. Woch.*, 1907, 4.

4. *Deutsche Med. Woch.*, 1907, 22.

5. *Deutsche Med. Woch.*, 1907, 28.

6. *Abst. in Centralblatt f. Bacteriologie* XI., p. 397.

7. So far from mercury and Atoxyl being incompatible, Boyce (*Abst. Deutsche Med. Woch.*, Sept. 26, 1907, p. 1645) has found that cases of sleeping sickness and other trypanosome diseases which can not be cured by either mercury or atoxyl alone can be cured completely by using both remedies.

8. It should be remembered that the inoculation of syphilitic products into the limbus of the rabbit produces, after quite a long incubation, a typical interstitial keratitis.

9. *Verein beilage Deutsche Med. Woch.*, Aug. 10, 1907.

10. *Deutsche Med. Woch.*, 1907, 34.

11. *Zeitschrift f. Augenheilk.*, 1906, *Erganzungsheft*, p. 47.

12. Cited by Krudener.

13. *Abst. in Wolffberg's Wochenschrift*, Aug. 1, p. 348.

14. *Deutsche Med. Woch.*, 1907, 46.

15. *Gracie Sacmisch*, 2d edition, *Cap. XXII* 2, p. 51.

A NEW PTERYGIUM KNIFE.

H. B. YOUNG, A. M., M. D.

Burlington, Iowa.

(Illustrated.)

Something over a year ago, while operating for pterygium, it occurred to me that an improvement could be made upon the usual scissors and Graefe knife method of abscission—the former not abscising cleanly, and the latter catching (gouging) at the point, or faceting more or less when the body of the blade did the cutting. Besides this, on an eye set deeply in the orbit, the Graefe knife is difficult to handle.

The angular keratome of Jaeger, with certain modifications of the blade, appealed to me as a probable solution of the difficulty,



and I therefore asked V. Mueller & Co. to grind one of these blades into a kidney or pointless sickle shape, sharp all around. The first use of this knife showed me that, in it, I had an ideal dissector, but that it would be better to have right and left knives. For, standing at the patient's head, the upper border of the growth could in this way always be seized, the blade entered at the limbus, and worked with the *convexity* forward to the farthest attachment, which would give better purchase and reduce slipping to the minimum; while a backward sweep with the *convexity* would be sufficient for detachment from the sclera. The convexity can, moreover, be used as a curette for the limbus if needed.

The short, broad, pointless, angular blade allows one to follow perfectly the contour of the globe, and this makes rapid, smooth, and accurate abscision a very simple matter. The more I use these knives the more satisfied I am with them.

In the illustration herewith the artist, in order to show the angle, has taken a quartering view, which makes the blades appear longer, narrower and more crooked than they actually are.

ON MITTENDORF'S LENS-SPOTS.

BY H. GIFFORD.

OMAHA, NEB.

In 1892 Mittendorf called the attention of the American Ophthalmology society to the frequency with which a small opacity is found in otherwise perfectly normal eyes, on the posterior surface of the lens a little to the nasal side. In the October number of the OPTHALMIC RECORD, 1906, he again refers to this condition. He describes the spot as varying in size from that of a poppy seed to a mere point, in some cases being only loosely attached to the lens-capsule. Out of 10,000 patients he has found it in one or both eyes 145 times, or in nearly 1½ per cent of the patients. Mittendorf regards the spot as a remnant of the attachment of the hyaloid artery to the lens-capsule.

Since Mittendorf's first communication I have noticed these

spots from time to time, and after his second article I made a record of the cases in which I found them. In approximately 1,500 cases I have found the spot on one or both eyes of 31 patients, or about two per cent. In four cases they occurred in both eyes and in those in which only one eye was affected twelve showed it in the right eye and fifteen in the left. This distribution between the two eyes does not correspond with the figures of Mittendorf, who found it in the right eye 108 times and in the left only 24 times. As to the distribution between the sexes, in four cases the sex was not noted, but of the other 27, nineteen were females and eight males. Mittendorf also found a large number of females showing the spot, namely 83 to 56 males; and he considers this disparity to be easily explained by the fact that he had so many more female patients, an explanation which applies to my own figures to some extent.

Regarding the appearance of the spots, they generally, when viewed with a $\times 7$ lens, appeared to be about $\frac{1}{2}$ mm. in diameter, but varied from this down to a mere pin point on the one hand to two or three times this size on the other. The borders of the larger spots were apt to be irregular or when viewed with a higher power, somewhat fuzzy.

I think that Mittendorf's explanation of the origin of these spots is unquestionably the correct one, they occur so regularly slightly to the inner side of the posterior pole of the lens that they could hardly be anything else than the remains of the hyaloid artery. They have no influence upon the sight and hence are of developmental rather than of pathological interest.

So far as I know, no one else has published anything confirming Mittendorf's interesting observation, and this is my only excuse for writing upon a subject to which I can contribute nothing new.

SYPHILITIC PARALYSIS OF ACCOMMODATION.

LINN EMERSON, M. D.

On call, 5th Avenue, to The Orange Memorial Hospital, The New Jersey Orthopedic Hospital, The House of Good Shepherd, and The Orphans' Home.

ORANGE, N. J.

J. S., age 24, expert machinist, came under observation April 22, 1907, stating that his eyes had failed suddenly.

Vision in each eye was 20/40 and a $\times 1.25$ S glass improved to 20/15.

Pupillary reaction was but slightly impaired, but accommo-

dation was very weak, a -3.75 S being required to read J. No. 1.

No cause could be ascertained, the patient claiming to be in the best of health, and giving no history whatever of having had a sore throat. As these cases are usually post-diphtheritic, the sore throat sometimes having been mild, I gave this patient strychnine sulphate in ascending doses for more than a month.

No improvement occurred, and finally after a severe cross-examination, the patient confessed to having had syphilis three years before.

He had taken treatment under a reputable and careful physician for two years, and considered himself fully cured.

The use of full doses of iodid and mercury resulted in complete cure in about five weeks.

The progressive restoration of the power of accommodation from week to week was interesting to observe, a weaker spherical glass being required for reading at each visit, subsequent to the beginning of the specific treatment.

ULCERATIVE KERATITIS PROBABLY DUE TO TROPIC CHANGE.

By J. WILLIAM PANCOAST, M. D.,

Chief of Clinic, Pennsylvania Hospital, Out-Patient Department, Ex-Assistant Surgeon
Will's Eye Hospital.

In reviewing the ophthalmic literature, one is surprised with the few failures that are reported among our private and hospital patients, but the following case is interesting in showing the rapidity with which an eye may be completely destroyed, while the patient is surrounded by the best environments.

In March, 1905, W. L. S., aged 42, consulted the writer, complaining of the usual symptoms of asthenopia, the vision of each eye was $5/12$ and under full mydriosis the refraction was found to be R. -0.15 cyl. axis 90° , the L. -1.00 cyl. axis 80° , giving a vision of $5/4$ in each.

The complete examination of each eye was negative, with the single exception of the refractive error, fortunately time was not at a premium and the fields of each eye were taken and no changes noted.

On November 24, 1905, the patient again consulted the writer, stating that he had been entirely comfortable until three days before, when a severe pain started around the region of the left eye, covering an area of about three square inches, he especially stated that the eye itself did not pain but upon the slight-

est manipulation of the lids, a profuse lachrymation would start and continue for about ten minutes.

He gave a distinct history of rheumatism, of rather a neuralgic type, his general health was "better than for some years" although he had been forced to give up his employment about one year before, on account of threatened tubercular trouble.

Examination of the right eye was negative throughout.

Left cornea was clear with a very small foreign body down and slightly out, this was so small that with an unusually dark iris as a background, it was nearly impossible to see, by oblique illumination.

Pupil was 8 mm. (Atropin instilled the day before by a local doctor), circular, a very slight congestion of the tarsal conjunctiva, tension normal, intense lachrymation and photophobia.

Vision without his glass was 5/12 with the correction 5/7.5.

Ophthalmoscope showed a rather high colored fundus, with a disc of fair size, vertically oval and fair color, no gross fundus changes.

The foreign body was removed under cocaine and a collyrium of sodium hyposulphite ordered, with a capsule of strontium salicylate with camphor monobromate for internal use, and the patient was directed to call on the following day.

On the 25th he complained of a more severe pain over the entire left side of the face, covering the area of distribution of the second division of the fifth and part of the seventh nerve, this entire area was very sensitive to pressure.

There was a feeling as though a foreign body was still in the conjunctival sac, increased photophobia and lachrymation, nearly a complete insomnia and a weakness so marked as to require a carriage both to and from the station.

Examination of the eye showed a small pin-point ulcer at the site of the removed foreign body, with a rather yellowish-gray base, tension normal, cornea insensitive to cotton point, slight increase of the tarsal congestion with some engorgement of the superficial bulbar conjunctival vessels.

Vision without a glass was 5/100, but the finger field apparently was not altered, an ophthalmoscopic examination was impossible, due to the photophobia and lachrymation.

Urine was examined both chemically and microscopically and found to be negative.

Under cocaine the deep superior sulcus was examined and nothing of a foreign nature discovered.

For treatment the ulcer was cauterized with carbolic acid, scopolamine $\frac{1}{2}$ per cent was ordered, and the capsule directed to be taken with greater frequency with sulphonal for the insomnia.

On the 26th the patient was more comfortable, but the sensitiveness over the pain area was still present, together with a weakness out of proportion to the condition or symptoms, he was unable to leave his bed.

The condition at this visit had changed to a slight edema of both lids with a slight mucoid discharge, tension was reduced to minus two with a ball very sensitive to pressure.

The lower two-thirds of the cornea was covered with a large necrotic ulcer, without perforation or hypopyon, some chemosis of the bulbar conjunctiva and vision reduced to light only.

The treatment consisted in changing the scopolamin to atropin, and iodoform dusted into the conjunctival sac with a collyrium of formalin 1-10,000, to be used every hour, and asked that a consultant be called into the case, but this was declined.

My visit on the 27th found the patient free from pain, except by pressure on the left side of the face as above noted.

The entire cornea was now necrotic without any hypopyon or pus formation, ball was very soft, increase in the chemosis, though this was never very marked, the vision was completely lost.

No change in the treatment was made, except to increase the formalin to 1-9,000, but a consultant was insisted upon and finally one of the best ophthalmic surgeons was called to see the case.

The following day the consultant advised the immediate removal of the diseased eye: this was accomplished under ether.

Immediately after its removal, the eye was opened, and found to have a fluid vitreous, complete detachment of the retina and most of the choroid from the ciliary body back, the ciliary body was thickened and congested, the cornea had been destroyed down to Descemet's membrane, so thin that it hardly held together, but not one particle of pus was found at any point in or around the eye.

On the choroid was found several (12-20) well marked nodules that were pronounced as being of tubercular origin, and a diagnosis of tubercular ulceration advanced.

Rapid recovery followed the enucleation, but marked by a peculiar and unusual "numbness" over the pain area, that did

not completely disappear for about five months after the operation.

With the diagnosis of tubercular ulcer the writer has never been able to agree, the progress was too rapid, covering a period of but seven days from the first symptoms to the removal of the eye, while he is willing to admit the bad tubercular history and that the nodules were identical with those found in miliary tuberculosis elsewhere in the human anatomy, this is the only reason for the above diagnosis.

He would rather suggest one of the three following reasons as a cause, being rather more inclined toward the last than the first two:

The first would be an infection when the foreign body was removed, although all the usual precautions were taken at that time; or secondly, an infection during his return home, by some material transferred by the finger, from the window sill or car seat, to the wounded eye.

These reasons are rather questionable, because the course was too rapid for any bacteriological explanation, and also the total lack of pus at any stage of the disease.

Rather would the writer suggest a trophic change as offering the best explanation for the condition, for Dr. C. K. Mills, in "The Nervous System and Its Diseases," on page 859, distinctly speaks of the trophic influence of the trigeminus nerve and it was with this nerve that the first symptoms appeared, and from the first there was a complete anesthesia of the affected cornea, supplied by a branch of the seventh, together with a peculiar numbness over the area of distribution of this nerve, this would certainly suggest some trophic change in the periphery of the long ciliary nerves as a cause of so rapid and extensive an ulceration, the foreign body being secondary and tributary to the general condition.

After its removal the eye was placed in the usual hardening fluid, for study, but by some unfortunate mistake it was mislaid and when found was so hard that section study was impossible.

This was unfortunate for only by careful microscopic and bacteriologic study by a pathologist, could a true and accurate diagnosis be made.

1611 North Thirteenth Street, Philadelphia, Penn.

SURGICAL INTERFERENCE IN CHOKED DISC.

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(Illustrated.)

Read before the Allegheny County (Pa.) Medical Society, Dec. 17, 1907.

The importance of opening the skull early in all cases of increased intracranial pressure (whether it be done with intent to remove the cause when located or merely to relieve pressure), accompanied by choked disc, has been ably expounded during the past ten years by Sir Victor Horsley (1), Cushing (2), Spiller & Frazier (3), Starr (4), Paton (5), Chance (6), and others.

Horsley (8), speaking of palliative or decompressive operations says: "It is a prominent characteristic of intracranial disease that (a) it is liable to produce optic neuritis, which customarily ends in total blindness; (b) it may concomitantly cause severe headache and vomiting, all of which symptoms are dependent on pressure, and can be completely palliated or wholly removed by making a sufficiently free opening in the skull and dura mater. The first of these, namely, optic neuritis, is a condition which, owing to its causing blindness, is of such vital importance to the interest of the patient, and so to the community, that it merits full attention. In 1886 its pathological causation was a matter of acute controversy, but we learned by a very few years of operative surgical experience that, whatever other factors might be concomitant, the most important one in the production of optic neuritis was increase of the intracranial tension, and thus it happened that our earliest experience was the strikingly rapid subsidence of the optic neuritis when the skull and dura were opened. Therefore it is now possible to dogmatize on this question, and to say that in no case of optic neuritis (not of course of toxæmic or anaemic origin) should the process be allowed to continue after it has once been diagnosed, and that if blindness results therefrom the responsibility is very heavy on any one who fails to advise such a simple proceeding as opening the dura mater."

Choked disc occurring in connection with increased intracranial pressure, whether the latter be due to brain tumor, cyst, abscess, internal hydrocephalus or aneurysm, differs from optic neuritis of orbital or constitutional origin in that the impairment of vision in its early stage is less, signs of true inflammation of the nerve fibres are lacking, and the probability of preserving a normal nerve is great if the pressure be relieved early.

The clinical and anatomical pictures of choked disc due to high intracranial pressure are graphically drawn by Gunn (?): "Clinically, a swelling of the intraocular end of the nerve, accompanied by distention of its small vessels; the oedema, simple at first, leading later if unrelieved to signs of inflammation, the vena centralis not engorged in the earliest stage; no visual failure such as we should expect in a descending or retro-ocular affection

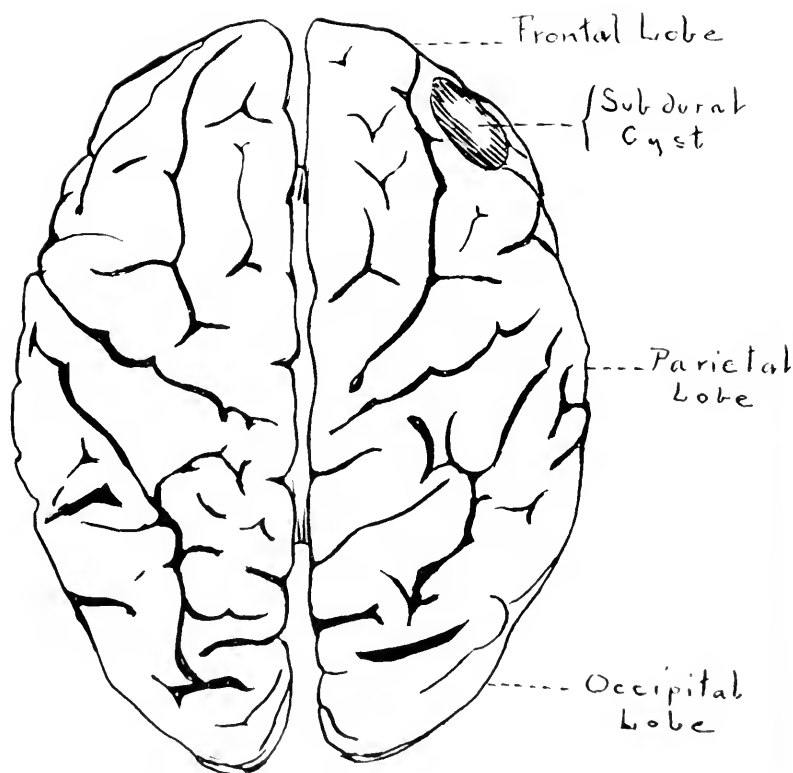


Fig. 1.

of the nerve, either inflammatory or oedematous; disappearance of the papilla oedema, without visual failure, on early removal of the high intracranial pressure.

Anatomically we have in these cases distention of the cerebral ventricles; escape of fluid into the subarachnoid space of the brain and spinal cord; a fluid distention of the inter-vaginal space round the optic nerve, particularly apparent at its termination; a simple

oedema of the papilla in early cases, separating and displacing but not causing actual danger to the nerve fibre bundles: and no evidence of the presence of pathogenic material in the inter-sheath fluid."

These views held by an observer who has examined in the neighborhood of a thousand cases of tumor-papillitis should be accepted as conclusive.

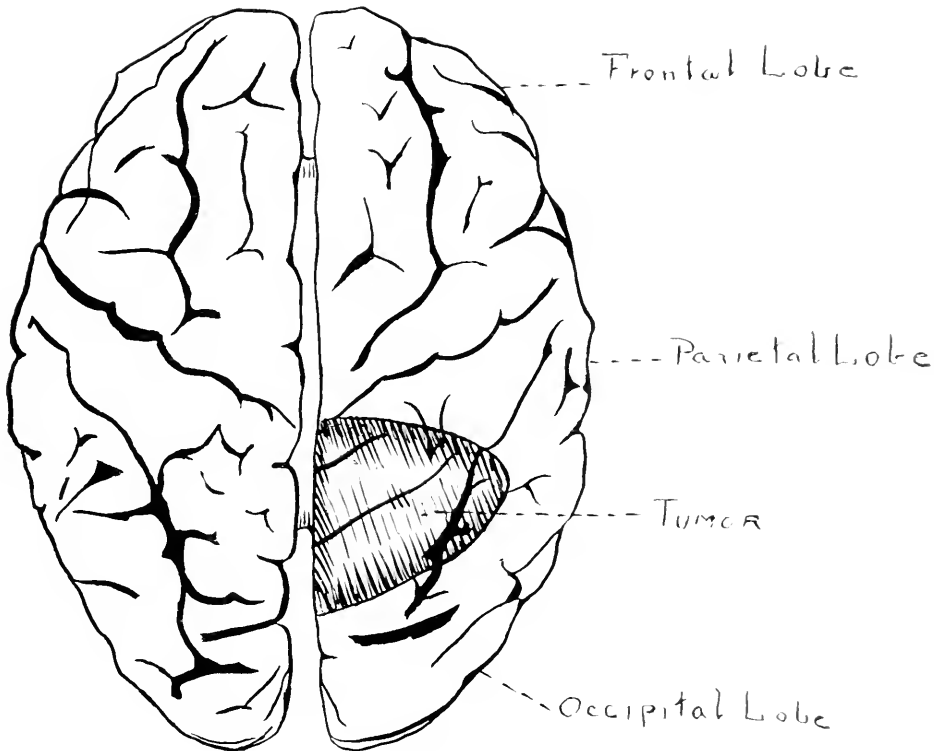


Fig. 2.

Leslie Paton (9) read a paper before the Ophthalmological Society of the United Kingdom on the course of optic neuritis and its subsidence after operation in cases of cerebral tumors, analyzing a series of 105 cases, in 30 of which it was possible to observe the optic nerves after operation. Of these there were eight cases in which the vision was little if at all impaired. In eleven cases the patients were blind or almost blind before the

operation: afterwards their vision recovered, in some even up to normal acuteness of sight. There were three cases in which one eye retained good vision while the other became blind or nearly so. Six cases regained no vision and in but two had the vision failed markedly in spite of the operation.

On the appearance of the discs after operation Paton noted that the swelling subsided steadily and gradually and that in cystic cases the subsidence was most rapid. In those cases which ended in blindness the disc assumed a papery-white appearance with arteries much diminished in size. In some cases where the sight was retained the disc had usually a muddy grayish-pink appearance, but this tended to disappear. In some of the cases it was impossible to tell from the appearance of the disc that there ever had been optic neuritis at all.

My experience with measures other than operative to relieve choked disc when due to intracranial pressure has been discouraging and similar results have been reported by others. I have in mind a boy, aged seven, with headache and asthenopia, whom I examined in March, 1906, finding a moderate degree of hyperopia and astigmatism. A full correction was ordered which gave him complete relief until June of the same year when he was again brought to me with the history that for two weeks he had been having severe headaches with vomiting, stumbling when walking and rapidly failing vision. Vision now equalled counting fingers at 1 foot with right eye, 6/30 with left eye. Ophthalmoscopic examination revealed double choked disc, the right nerve head presenting an elevation of 5 D., the left 3 D. Consultation with Doctors C. Emmerling and T. M. T. McKennan resulted in a diagnosis of tumor of the cerebellum, probably syphilitic. The little patient was put on sodium iodid in increasing doses with daily inunctions of mercury. When 30 grains t. i. d. had been reached the general symptoms and papillitis began to improve and continued to steadily abate until he was taking 60 grains t. i. d. when his stomach rebelled and the iodid was withdrawn but the inunctions continued. August 24, 1906, R. V. corrected = 6/15, L. V. corrected = 6/9; beginning atrophy both discs, right more advanced. Patient was now put on strychnia and phosphorus, continuing the inunctions. September 19, 1906, vomiting and headache again developed with marked ataxic gait, and choked discs reappearing, the maximum dose of sodium iodid was ordered and rapidly increased until 90 grains t. i. d. were being taken, followed by relief from headache and vomiting, although the ataxic

symptoms persisted. His condition remained about the same until December 11, 1906, when convulsions, persistent vomiting and intense headache prostrated the patient to such a degree that death was predicted. In consultation with Doctors Emmerling, Gaub, and McKennan an immediate operation was advised, to remove the tumor if possible, but at any rate to give the patient decompressive relief. Consent to operate was withheld by the child's mother, however, and after a few days the symptoms began to improve, the child making a more or less complete recovery, but with marked impairment of vision. July 8, 1907, R. V. = 6/200 with disc chalky-white and vessels much reduced in size, L. V. = 6/15 with correction; disc gray, arteries small.

Baker (10) reports a somewhat similar case. A boy 16 years old with enormously swollen discs and general symptoms of brain tumor. Sixty grains of iodid of potash would relieve the headache and when continued several days would cause a marked diminution in the swelling of the discs, but when the iodid was stopped, in the course of a week or ten days there would be a return of the headache. There were no focal symptoms to localize the tumor. After several months of treatment the patient suddenly died, two days after treatment had been stopped. Autopsy revealed a cerebellar tumor, centrally located, pressing upon the floor of the fourth ventricle. The ventricle was enormously dilated, holding about a pint of fluid. The growth was a glioma. Baker believes that the large doses of the iodid partially removed the fluid in the ventricle and thus relieved the headache.

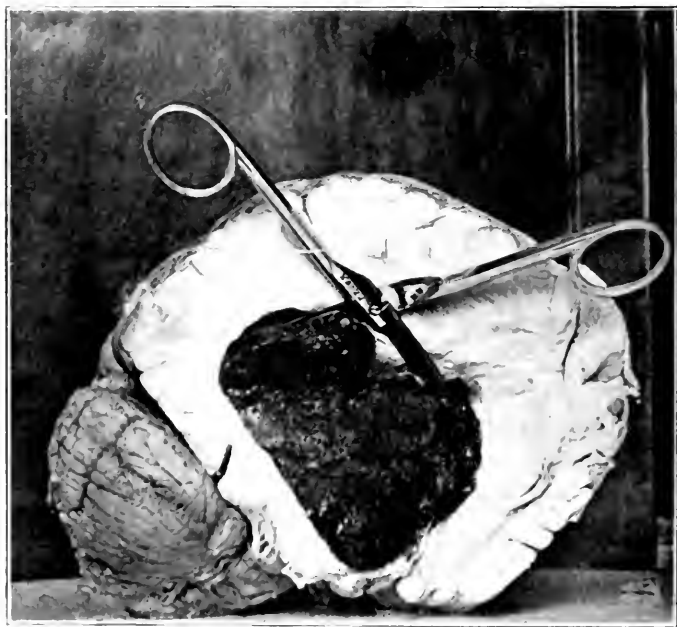
The three following cases show the good effects of opening the skull and dura on the optic nerve and vision, and also in lessening general pressure symptoms.

CASE 1.—Jacksonian epilepsy with traumatic and specific history, choked discs and headache. Operation. Sub-dural cyst over right frontal lobe. Relief of papillitis and headache but no effect on epilepsy.

J. A. McP., age 39, oil well driller, was admitted to the West Penn Hospital, May 5, 1896. For the past three years he had been subject to convulsions, at first at intervals of from two to three months, later every two or three weeks. About seventeen years before admission he had been thrown from a horse, striking his head on a stone and has a depressed scar about two inches long over the right frontal region. Two years before receipt of the injury patient contracted syphilis, but claimed to have taken treatment faithfully for four years. Upon admission he com-

plained of a constant frontal headache, failing vision and "nervous fits." Examination revealed the scar above alluded to and marked papillitis of both discs. In all other respects he appeared normal, a vigorous, muscular man, weighing two hundred pounds and over six feet in height. He received potassium iodid in ascending doses up to grains 40 t. i. d. and mercury by inunction for two months, with no amelioration of the symptoms, the papillitis advancing, the headaches more severe, with Jacksonian epileptic attacks at intervals of from ten days to two weeks.

Operation July 30, 1896, by Dr. F. LeMoine. Frontal



Case 3. Tumor (Vascular Glioma).

craniectomy including the depressed scar. Both tables of the frontal bone were found to be depressed and the dura adherent to the inner table. Immediately beneath the depression a cyst containing about two ounces of fluid was found and removed. The cyst was between the meninges and did not extend into the brain tissue.

The operation was followed by prompt and complete cessation of the headache and the papillitis subsided in two weeks.

The epilepsy, however, continued. He left the hospital on his own responsibility six weeks after the operation, during which time he had two epileptic attacks. The location and comparative size of the cyst is shown in the accompanying drawing. (Fig. 1.)

CASE 2.—Sarcomatous tumor of the superior parietal convolution. Jacksonian epilepsy, choked disc and paralysis of right motor oculi. Two operations, tumor only partly removed on account of sudden collapses. Complete relief of motor oculi paralysis, prompt subsidence of papillitis and marked amelioration of general symptoms for more than two years.



Case 3. Three Years After Operation.

This case having been so thoroughly presented before this society by Dr. Diller, November 17, 1903, and fully described by him (II), further reference to it is unnecessary, except to observe that had not the alarming hemorrhages occurred during the operation (coming no doubt from the longitudinal sinus) and necessitating prompt packing of the cerebral cavity to prevent death on the table, it is more than probable that the tumor could have been removed entirely, since it occupied a superficial location

and at the time of operation must have been considerably smaller than when found post mortem two years later. As it was, removal of but a portion of the growth was followed by prompt subsidence of the choked discs, a preservation of useful vision and a marked improvement in both the mental and physical condition of the patient. The accompanying drawing illustrates the location and comparative size of the tumor as found post mortem. (Fig. 2.)

CASE 3.—Tumor of the right cerebral lobe, arising in the optic thalamus and completely filling the lateral ventricle. Convulsions, intense headache, double choked disc, sixth nerve paralysis. Decompressive operation followed by relief of abducens paralysis and subsidence of choked disc. Death three years and four months later. Necropsy.

W. J. R., age 40, married, millworker. Previous history: Denied lues; free user of tobacco and moderate user of beer, tea and coffee. Had always been healthy and robust, with the exception of a right suppurative otitis media which began in infancy and ceased spontaneously at 28 years of age. Examination of eyes February 2, 1904, patient in bed with violent explosive attacks of headache. Both pupils were strongly contracted and equal; muscular balance apparently normal. Ophthalmoscopic examination (pupils dilated with mydriatic) revealed a well established papillitis in the right eye without retinal lesions, and a beginning papillitis in the left eye.

These findings were reported to Dr. I. J. Moyer, who prescribed ascending doses of potassium iodid. Developing convulsions and headache becoming almost continuous, the patient was removed to Mercy Hospital, March 7, and prepared for trephining. He was strongly averse to an operation, although the headache was now almost unbearable. March 10 a free discharge of yellow fluid occurred from the nostrils, followed by relief from headache, but the convulsions persisted and a subsequent ocular examination March 11 revealed increasing pressure at the base of the brain, evinced by an advance in the papillitis in both eyes, with scattered retinal hemorrhages, and a paralysis of the right externus.

R. V. 6/27, with + 2, D. S. V 6/12.

L. V. 6/27, with + 2, D. S. V 6/12.

Examination of his ears revealed a much retracted drum head on the right side with an extensive adherent cicatrix. The left tympanic membrane was dull and retracted from middle ear

catarrh. Rinne negative left ear, absolutely negative right ear. (This examination was made in order to exclude a possible temporo-sphenoidal abscess from middle ear suppuration which had ruptured and drained through the cribiform plate of the ethmoid. Dr. Day had previously examined the patient's nose and frontal sinus with the thought that the gush of pus might have been due to frontal sinus disease which had cured itself through rupture and which could have been an intercurrent and independent affection. His examination, however, disproved any such possible occurrence.) He was examined March 21 by Dr. Diller, who obtained the following history: The first symptom dates back to January, 1902, and consisted of a disorder of the sense of smell, the perception of some unusual odor at periodic intervals and associated with some mental confusion. In November, 1903, the patient complained of headache located in the frontal and occipital regions, and began to show some failure of memory, repeating himself often in conversation and exhibiting unusual dullness of perception. At times he was loquacious and at other times irritable. Formerly possessing an even-tempered and phlegmatic disposition, he now evinced great nervousness and restlessness awake or asleep. He became childish in his manner and entertained extravagant ideas out of which he was easily persuaded, however, often relapsing into a dull lethargic condition.

A "smell attack" would sometimes be followed by a convulsion during which consciousness was not lost and after which he would recover and resume his occupation. At times he had a strong tendency to sleep out of which he could be wakened only with great difficulty. The headaches became more frequent and were markedly worse on the right side. With the exception of the right abducens paralysis there had never been any motor disturbance.

Examination. The mental condition is somewhat dull and sluggish. Stereognostic appreciation normal. Hearing dull, eye sight affected, taste apparently normal, sense of smell affected, more marked on the right side. Temperature, pain and tactile sense normal. Knee jerks are equal. On percussion the right side of the forehead appears more tender than the left.

Diagnosis: Cerebral tumor, probably of the right frontal lobe. Operation March 30, 1904, by Dr. R. W. Stewart at Mercy Hospital. A large bone flap was made exposing the base of the frontal and part of the parietal lobe. The meninges were found to be normal. Digital exploration into the anterior fossa failed

to reveal any abnormal condition nor did repeated puncture of the frontal lobe discover a tumor, either solid or liquid. The dura was freely opened and search made in all directions but with negative result. The patient made a speedy and uneventful recovery with a moderate cerebral hernia. The papillitis rapidly subsided and the right external rectus fully recovered. The vision improved correspondingly reaching 6/4 in either eye corrected and remained so until the last examination, about a month or so before his death, which occurred August 8, 1907, at the Protestant Home for Incurables. During his residence at the Home (ad-



Enormous Hernia to Accommodate Growth in Interior of Brain.

mitted March 10, 1906) he would have a convulsion about once every three weeks, lasting from eight to twenty minutes before regaining consciousness and always falling toward the left. A convulsion would be preceded by twelve hours of headache; following the convulsion he would remain in a stupid condition for about twenty-four hours, which was always accompanied by a rise of temperature to about 102° F. The last convulsion began August 6, about 3 p. m., unconsciousness intervened, and terminated in

death August 8, at 10 a. m. There was no rise in temperature during the first twenty-four hours, after which it rose steadily, reaching 105.4/10 just before death ensued.

Post mortem eight hours later. Brain only could be obtained. The meninges were found to be tightly adherent to the scalp and margins of the opening in the skull and were loosened with the greatest difficulty. The cerebral hernia comprised about one-half of the frontal lobe and about one-third of the parietal lobe, extending from the fissure of Sylvius to within an inch of the longitudinal fissure.

Base of brain: To the right of the optic commissure is an enlargement of the brain structure, smooth and about the size and shape of a small peanut, extending backward from the optic thalamus to the pons and right half of the cerebellum and resting on the side of the optic thalamus.

Serial sections made through the cerebrum from without inward, toward and parallel with the longitudinal fissure, revealed the tumor mass extending upward into the lateral ventricle, elevating the roof about 3 m.m. to accommodate the size of the tumor which was about that of a tangerine orange.

The tumor was firm in consistency, exuding a gelatinous discharge on cutting, dark red in color and presenting a sharp line of demarcation, in striking contrast to the surrounding gray and white matter of the brain. Microscopical examination by Dr. W. H. Ingram proved it to be a vascular glioma.

A consideration of the subject of tumor papillitis should include the question, how long shall medicinal treatment be carried on before surgical measures are decided upon? At the International Medical Congress in 1890, Horsley proposed a probationary period of medicinal treatment of six or eight weeks. Starr (12) believes that after three months of medical treatment have proved unsuccessful the surgeon should be called in. Barrett (13) says that unless there is some special contra-indication, all the non-syphilitic cases of optic neuritis should be trephined as early as possible, that the policy of waiting for vision to fail before operation is unsound. Personally I favor opening the skull and dura mater as soon as the diagnosis of increased intracranial pressure is established, instituting medicinal treatment afterward, if deemed necessary, in case the tumor cannot be discovered or removed, for the possibility always remains that a tumor may undergo retrogression. This happens in a certain proportion of inoperable cases.

In predicting the degree of vision that will be attained, much depends upon the ophthalmoscopic picture before operation. If signs of degeneration of the retina, especially in the region of the macula, are present the prospects are usually not of the best for recovering a useful degree of vision. Oedema of the nerve, moderate oedema of the retina with small hemorrhages, exudates along the course of the vessels and even larger exudates not in close proximity to the macula, need not deter us from expecting good results, for it has been demonstrated that these lesions disappeared or did not seriously interfere with vision after the retinal circulation had again been established.

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 8. Ibid.
 9. Ibid.
 10. Baker, Oph. Record., Vol. XV, p. 226.
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 13. Barrett, Ophthalmology, Vol. 1, p. 331.

3603 FIFTH AVENUE.

SOME EUROPEAN EYE CLINICS AND THEIR CLINICAL OPPORTUNITIES.

(Continued.)

BRESLAU, MUNICH, ZÜRICH, FREIBURG AND BONN.

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Breslau.

Prof. Wm. Uhthoff and the University Eye Clinic of Breslau have not received the recognition that they deserve. The clinic, situated in the midst of a group of university buildings on a height at the edge of the city, is a red brick building of modern structure, accommodating about 100 hospital patients. The interior arrangements are all up to date; the operating room especially leaving nothing to be desired. The clinic rooms and laboratories are large and light, thereby making a most agreeable impression.

Professor Uhthoff has three regular and several volunteer assistants, all of whom he considers his especial pupils, to guide and instruct in every way possible. He is perhaps in closer touch with his assistants and spends more time in demonstrating the daily cases to them than any of the other noted men I have so far visited. Moreover, the 6,000 patients yearly consist mostly of the more complicated and interesting cases, the minor injuries and lighter diseases being as a rule treated in the more centrally located clinics. These two reasons, augmented by the fact that Professor Uhthoff spends the whole morning in his clinic, should make Breslau the Mecca for those desiring individual work with time for original research.

The day's work begins at 10 a. m., when Professor Uhthoff, accompanied by the assistants, makes the hospital rounds and demonstrates the cases. Then comes the inspection of the new ambulatorium patients, Professor Uhthoff himself assigning the different cases to the various assistants so that each one has his proper share of the work and gets those cases which will be of most benefit and interest to him. He then retires into his private office, returning, however, in a short time to reinspect the in the meantime examined

cases and give the final opinion. It is at this period that the great advantages of close association with him are felt.

At 12:30 p. m., after the clinic, the university course of lectures is held, the microscope and stereopticon aiding in the elucidation of cases. This is followed by an operative clinic, the number of operations varying from 15 to 25 per week. The rigid asepsis observed and the calm nicety of operative technique is a treat to one accustomed to see the lack, especially of the former, in many of the European clinics.

Professor Uthoff is very friendly toward Americans, and will receive any one who wishes to work as voluntary assistant. No special courses, outside of the regular university courses, are given. This year in the month of October special clinical courses and lectures in all branches were held gratis for the benefit of all physicians. It is the intention of the Medical Faculty of the University of Breslau, which contains the names of such noted men as Uthoff, Mickuliz, Czerny, Strümpel, Hinsberg and Neisser, to give this course of lectures every October, and it would be well to time one's visit accordingly.

The Eye Clinic is located at Max strasse No. 2, and can be readily reached by electric tram.

Living expenses are less in Breslau than in the larger cities, one being able to secure good pension for from 100 to 120 marks (\$25 to \$30) per month. For a short stay the Kaiserhof Hotel, Neue Taschenstrasse 15, near the railway station, is convenient. The rates are from 2½ to 5 marks per day. Meals had best be taken at Restaurant Dresdener Hof, about three minutes further up the street, where for 1.25 marks a fairly good dinner table d'hôte can be obtained.

Munich.

Professor Eversbusch has moved his clinic to an architecturally beautiful and practical new building on Matilden strasse No. 2. The hospital, of which one wing is as yet unfinished, will have about 150 beds, divided into first, second and third class. There are separate entrances each for private patients, ambulatorium patients and students, so as to avoid any interference between these classes of visitors. The interior closely resembles our most modern hospitals, with the exception that a larger area has been devoted for windows, thus giving magnificent light. Fully one-fourth of the space has been used for laboratories, there being separate, large, well arranged and excellently equipped rooms for histo-pathology.

bacteriology, blood and urinalysis, x-ray therapy, photography and physiological optics. Professor Eversbusch has his own private waiting and consultation rooms, the latter furnished in Flemish oak. The lecture rooms are two in number—a smaller one for about 30 to 40 and a larger excellently illuminated room for about 200 students. The latter is to be supplied with a Zeiss epidioscope and projection apparatus. The dark room contains 30 stalls and a stereopticon for the demonstration of the cases being examined.

The Ambulatorium is under the direct charge of First Assistant Dr. Lohmann, aided by three other assistants and four voluntary assistants. The patients are divided for treatment into two classes, new and old cases. The new patient goes into an "Einschreibe Zimmer," where he is registered and receives a card and a history sheet. He is then examined by one of the assistants in a large semi-circular room, which has large windows in the convex side and is good for all purposes except refraction, for which it is used. The light is too diffuse, and on account of interference with the other examiners the room cannot be darkened, so that the staff is at present wrestling with the problem of how to get the proper illumination for their test type. After examination the patient is referred to Dr. Lohmann, who also personally treats the patients on all subsequent visits, using entirely separate waiting and treatment rooms. This arrangement is extremely unsatisfactory for the other assistants, as they do not again see the patient after the first examination and are therefore unable to follow out the case.

There is a separate room for the treatment of gonorrheal cases. The hospital patients have their own examination and treatment rooms on the second floor. The second and third floors have each their own operating room, and here it is of interest to note that Professor Eversbusch now operates on an operating table and not in the bed, as formerly. The hospital also contains a large electro and hydrotherapeutic department, as Professor Eversbusch is a firm believer in these methods. There are numerous telephone connections throughout the building and small elevators, for the transfer of microscopes and specimens, connect the laboratories and lecture rooms. The hospital also contains isolation quarters for contagious and infectious cases, and in the rear of the garden there is a small separate building for experimental work on animals. Many spacious terraces into the garden aid in the general comfort of the patients.

The number of patients treated yearly is about 9,000. No

special courses outside of the regular university work are given. Professor Eversbusch operates as a rule between 7 and 9 a. m.

Professor Schloesser's hospital and polyclinic, Herzog Wilhelmstrasse 19, is one of the largest private clinics in Europe, treating 7,000 to 8,000 cases yearly. It is a large, modern building, with numerous verandas for the use of the patients. Courses for university students are given Wednesdays and Saturdays from 12 to 1 p. m. and Mondays and Thursdays from 6 to 7 p. m. First Assistant Dr. Michelsen assists in giving these courses.

Both in Professor Eversbusch's and in Professor Schloesser's clinics voluntary assistantships can be obtained by personal application to the respective professors.

For those wishing to stay only a short time Hotel Wolff, opposite the Centralbahnhof, with rooms from 2 to 3 marks, can be recommended. Good pensions are plentiful, especially in the northwestern part of the city. Their charges are from 100 to 150 marks per month.

Zurich.

The University Eye Clinic is situated on Ramistrasse next to the Polytechnikum, in the southeastern part of the city and among the group of university buildings. Professor Haab, best known probably through his introduction of the giant electro-magnet for the removal of iron and steel chips from the eye and almost equally noted for his many scientific contributions, is chief of the clinic.

The hospital has only about 60 beds, while the number of patients treated in hospital and ambulatorium is 6,000 yearly. The room devoted for the ambulatory clinic is ample, but I cannot say as much for the pathological and bacteriological laboratories. Although they have an ample equipment, they are too small for working with any degree of convenience. This is especially noticeable after visiting the other, but, however, newer, clinic buildings in the other cities.

Professor Haab begins his hospital visits very early in the morning, often between 7 and 8 a. m., and begins operating immediately after, so that it is best to be there not later than 8 o'clock.

No courses are given outside of the regular university lectures, but a position as voluntary assistant is obtainable by personal application to Professor Haab. The Swiss language is, of course, somewhat of a drawback, but a fair knowledge of German will answer all purposes, as many of the Swiss either speak or can at least partially understand it.

Professor Krönlein, the general surgeon, who originated the bone-flap operation for retrobulbar tumors, is also in Zürich, and should, if time permits, be visited.

For a short stay Bauer's Hotel Garni Beatengasse 13, rooms 2½ to 3 franks, can be recommended. Meals can be had in the restaurant at reasonable prices, and the cooking is excellent. Pension in private families can be obtained for about 4½ to 5½ franks per day.

Freiburg.

Freiburg is today the goal toward which the eyes of all the American students of Ophthalmology, Rhinology and Laryngology in Europe are turned, for here are working both Professor Axenfeld, whose recent book on the bacteriology of the eye is the most complete published, and Professor Killian, noted for his operative skill and conscientious teaching.

Professor Axenfeld's clinic is located on Albrecht strasse, and is a large, well equipped structure, to which a thoroughly modern addition is now being built. The old building is to be used exclusively for hospital purposes, while the new wing will contain the polyclinic and laboratories, which are to be equipped in the most approved manner. In the rear of this building Professor Axenfeld is erecting a large animal house for experimental bacteriological work.

Professor Axenfeld's clinic is not large compared to some of the clinics in the larger cities, but it is noted for the thoroughness with which each individual case is examined and worked out. The number of both hospital and ambulatory cases is about 4,000 yearly. Operative cases are not very abundant, so that an operative clinic is held only two times per week—Tuesdays and Fridays at 8 a. m. On account of the above conditions there is plenty of time for laboratory work and, as is well known, this time is advantageously utilized.

Instruction in Freiburg is, as a whole, meager, and consists mostly of a course of regular university lectures during the semesters and a two to three weeks' special course for general practitioners between the middle of July and the middle of August. The latter course is given by Docent Dr. Stock. The university lectures are held in the afternoon during the winter semester and from 7 to 8 a. m. after Easter, during the summer semester. Individual laboratory work in bacteriology and pathology can be obtained for fifty (50) marks per semester, but, although cut, un-

stained pathological specimens are distributed, no attempt at systematic instruction is made. Dr. Stock is, however, willing to give a desired special course for a small consideration.

For individual bacteriological work, Freiburg probably stands at the head of the various clinics I have visited, and all students can be assured of a cordial welcome and a hearty support in their work.

Living expenses vary considerably, from 40 marks per month for room, breakfast and washing, to 150 marks for complete pension. A favorite restaurant for students is "Gambrinus Halle," near the Martins Thor, where "Abonements Karten" reduce the prices to 1.10 marks for lunch and 1.50 marks for dinner. For a short stay the Bahnhofs Hotel, near the station (rooms 2 to 3½ marks), can be recommended.

Bonn.

Professor Kuhnt, whom I had the pleasure of visiting last year in Königsberg, is now, after almost a year's activity at the University of Bonn, entirely at home in his new surroundings. He at first had difficulty in accustoming himself to operate in a white tiled room flooded with sunlight, as he had been wont to operate in a darkened room and by condensed artificial light. He has brought none of his former Königsberg assistants with him, but has retained those of Professor Saemisch, who honors the clinic with frequent visits. The University Eye Clinic is located in the court of Wilhelm strasse 31, and is a modern structure, with large, spacious rooms. The clinic hours are from 9 to 12 a. m. The yearly number of patients treated is about 6,000. Operative cases are moderate in number. Professor Kuhnt holds a university clinic daily, using the microscope and stereopticon to illustrate the histological changes. During the vacation months of July and August special courses for physicians "Arzte Course" are given. Histology and pathology of the eye can be satisfactorily studied under the direction of Assistant Dr. Reis, a very able pathologist, while bacteriology can be pursued under the guidance of Dr. Zur Nedden, whose work has placed him among the foremost bacteriologists of today. The fees asked are moderate and commensurate with the length of the course.

The living expenses are about the same as in Freiburg. For a short stay Hotel du Nord, on Poppelsdorfer Allee, with rooms from 2 to 3 marks, and a good restaurant in connection, can be recommended.

(To be continued.)

METHOD OF MUSCULAR ADVANCEMENT.

BY PROF. S. KLEIN (Bäringen).

(Translated by Alfred Murray, M. D., Chicago.)

Presented at a meeting of the Vienna Ophthalmological Society, December 11, 1907.

At a meeting of this society on the 2d of March, 1904, I had the honor of presenting a paper relating to a method of muscular advancement, although I had already demonstrated a very successful case of this character in the February meeting. The chief feature of this method is that the fixation sutures of the advanced muscle, for instance the rectus internus, are passed above and below under the conjunctiva (or in and out of the conjunctiva bulbi close to the corneal margin—like a tobacco-pouch suture) around the entire cornea, not being tied until the opposite, namely in this example, the temporal side is reached. The muscle which has been drawn up to the corneal margin is there fixed, and its support is the intraocular pressure: the suture thus attains the greatest security imaginable. The complete publication of this method (which has been three times abstracted in the *Centralblatt f. Augenheilkunde*, pp. 80-8, and p. 284, 1904) is to be found in the *Wiener medizinischen Wochenschrift*, No. 18, 1904.

I now read in the February volume of the *Centralblatt f. Augenheilkunde*, 1907, p. 51, a short abstract concerning a proposed method of advancement of Dr. Cogan, of Cleveland, Ohio, which, to be short and to the point, represents my method as just described, without my name being mentioned in connection with it. I endeavored to procure the original of this publication, which required a long time, and in it there is, as a matter of fact, what was to be expected. It is an article by Dr. Cogan, who after he has criticised various things, and after he has criticized with particular severity the scleral suture—that is, the sinking into the sclera of the sutures fixing the advanced muscle, and the danger of perforation associated therewith—finally ends with the statement, using the words of the author: "I propose a method which I have used in one case with excellent result." * * * then * * * "it has the advantage of avoiding the danger of perforation and its possible consequences: it is easy of execution, since the suture is passed around the eyeball" * * * further * * * "instead of the scleral sutures, each suture is passed around the cornea, partly in the episcleral tissue, in that it is passed in and out of the conjunctiva in the manner of a purse-

string, and tied on the opposite side of the eye" * * * still further * * * "The method necessitates no scleral stitches, and its foundation (support) is the eyeball itself." (See OPHTHALMIC RECORD, Chicago, August, 1906, p. 361.)

The following are the exact words used in Dr. Cogan's article: "I wish to suggest a method which I have used but once with an excellent result."

"It has the advantage of eliminating the danger of perforation and its possible consequences, ease of execution, being tied around the eye itself."

"Instead of scleral sutures each one is passed around the cornea in purse-string fashion in and out of the conjunctiva and tied at the opposite side of the eye; the last two stitches going through the superficial sclera and tied with the surgeon's knot."

"The method has no scleral stitches to pull out and its support is the eyeball itself."

If the author had added that this method originated with S. Klein (Büringen) the matter would have been at an end. Because he did *not* do this, I find myself obliged to reclaim my property here in this place where I first presented it, at any rate—in case one assumed and accepts the bona fide of the author—to defend my property.

It is nevertheless worthy of mention that not only the description of the method, namely, of its main point, corresponds exactly, almost ad verbum, with my text, but that the line of thought which leads to its creation is the same as mine, in that Cogan also proceeds from the objectionableness of the scleral sutures, which is likewise considered in my article.

I ask permission to take advantage of this opportunity to report in addition, as a result of my further experiences in the matter of the method referred to, that I have since then used it in a further series of cases with satisfactory results. Only in one case was the effect insufficient, and in a second similar case, which also did not satisfy me, I was just at the point of repeating the advancement (ten days after the first operation), that is, to perform it on the other eye in order to distribute the effect in the two eyes, when I perceived that since the last inspection (forty-eight hours) the effect had experienced a further increase, so that an almost parallel position was attained, and only dynamic squint remained. In this case, also, as in all the preceding, the condition was one of divergent squint—strabismus divergens.

I quickly decided upon simple tenotomy (setting back) of the

externus of the second eye. The effect was a complete one. Entirely parallel position of both eyes was seen as early as two days after. Simple tenotomy of the antagonist of the advanced muscle can, therefore, be carried out on the other eye as an aid to the advancement. An effect too great, that is the transformation of a divergent into a convergent squint as a result of the advancement in *one* eye, I have never observed.

I should like to make known here still another experience, namely, that in the use of the tobacco-pouch suture, individual parts of the thread sometimes cut through the conjunctiva, although usually not until the second change of bandage (therefore to be observed after ninety-six hours). Once it was already to be seen after the first change of bandage (after forty-eight hours): with threads lying entirely under the conjunctiva such a thing never occurs. However, this occasional cutting through of the thread appears to exercise no effect, therefore also no detrimental influence, upon the ultimate result. The muscle is probably already adherent in its new location before the tearing through occurs.

Review.

IMPORTANT DIAGNOSTIC RESULTS OF TRANSLUMINATION.

H. VUELLERS, M. D.

AACHEN.

(Reviewed by F. A. Davis, M. D., Denver, Colo.)

The usefulness of transillumination as a means of diagnosis has been greatly extended by the observation of Vuellers. To these observations he was led by an accidental discovery. An eye with iritis was subjected to transillumination on account of a tumor observed in the iris. The results proved most curious. Not only did the pupil show red, but the redness, not confining itself to the pupillary outline, occupied an area much larger, encroaching upon the iris irregularly in different directions. By focal light the pupil was of normal contour, except for a slight flattening at the upper border, and did not in the least correspond to the fantastic figure formed by the outward passage of the transmitted light.

In another case of iritis the pupil, which appeared round by focal light, appeared as a quadrilateral area of red light when transilluminated.

These appearances are clearly to be explained by a local absence of pigment from the posterior surface of the iris, while the transparent stroma remains intact.

By transillumination the course taken by a foreign body through the iris was revealed. The iris stroma had healed and no irido-dialysis was visible with the ophthalmoscope, yet when the eye was transilluminated, a red area was seen outside the pupil at a point corresponding to a gap in the pigment layer of the iris.

Cases of irido-dialysis always show a much larger opening in the pigment layer than in the iris stroma. This, in the opinion of the author, may be due to the elastic pull of the pigment epithelium layer often spoken of as the dilator-pupillæ.

In two cases, complaining of photophobia when in the sunlight, transillumination demonstrated an absence of the retinal pigment in several places. These were eyes which were otherwise normal, there being no error of refraction nor ocular disease present.

In a case of persistent pupillary membrane, in which of course only the iris stroma persists, the pupil appeared in shape and size exactly as in the normal eye. Even in the presence of a complete leucoma the existence of the pupil and its reaction to light can be verified.

Vuellers has used the method also in cases of secondary cataract with the surprising result that the cataractous portions of the lens are lighted up, while the part unaffected appears dark.

But the most interesting and practical use to which Vuellers put his discovery was to determine, in a case of glaucoma, whether the disease was primary or secondary. The eye presented the following appearances: ciliary injection, smoky cornea, dilated pupil, deep anterior chamber; vision was fingers at 3' 4" m. Most careful investigation could discover no posterior synechie. Transillumination, however, demonstrated failure of pigment in two places. Atropine was given without result. A severe iritis had probably occurred, and the whole posterior surface of the iris was evidently adherent to the lens.—Diagnosis, secondary glaucoma. Posterior sclerotomy was done. The patient was discharged with vision of 5/6 Snellen.

ELECTRIC SUNSTROKE.

(*Scientific American*, November 30, 1907.)

On board a cruiser that was recently undergoing repairs at Portsmouth, it was necessary to piece a hole in the armor of a turret. The usual mechanical processes employed in such cases were so slow that a torpedo officer asked for permission to cut the hole by means of an electric arc. What this process consists of is well known; one pole of a source of electricity is joined to the

mass of steel to be cut; the other pole is connected with a large carbon having an insulated handle which the operator holds. The carbon is placed in contact with the metal and an electric arc is formed, melting the metal at the points where the carbon is successively presented. This undertaking, although not uncommon, caused a great deal of curiosity among the crew and drew a large number of spectators. Everything went well, and the steel of the armor, under the action of the current, melted like ice.

But the next day all the men who were present at the operation were either half blind or terribly burned. The officer who had directed the current, had the skin of his face completely puffed up and of a leathery color; from it ran a serous liquid like that from a blister occasioned from a burn. Several sailors who were at quite a long distance from the turret had their sight so badly affected that they had to be treated in the hospital, lest they should lose it entirely.

This was a characteristic case of electric sunstroke.

It is known that in the most common and least severe form sunstroke consists in redness accompanied by an irritating burning sensation that manifests itself on the parts of the body that have been exposed to the sun. Sometimes, if a person has remained for a long time under a very hot sun, the burning becomes a pain. The red tumefied skin looks like a case of erysipelas; later little blisters, full of a clear liquid, may appear on the injured portions. It was for a long time thought that these blisters due to the sun were burns; but it is not so; they are not present in the burns that workmen have received when exposed to very intense heats. They are produced by the light of the sun alone. If this light is reflected by snow, it becomes particularly dangerous, and more than one Alpine climber has learned this to his disadvantage. On the mountains on glaciers, or on fields of snow, the tourists may receive severe sunstrokes even with a cloudy sky and a cold atmosphere. These are true "sun-strokes in the shade" produced by chemical rays of light.

The electric arc, rich in chemical rays, particularly so when produced between certain metals, can give rise, as we have seen above, to the same symptoms that the sun is able to produce. Therefore, it is extremely necessary to protect one's self when one is exposed to a powerful arc or to the light of a mercury vapor lamp inclosed in quartz glass, which is permeable to ultra-violet rays. Ordinary glass employed in the manufacture of Cooper Hewitt lights stops the dangerous chemical rays sufficiently to render their effect unnoticeable.—Cosmos., N. M. B.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|---|---|--|--|--|
| 9 A.M. | Richard S. Pattillo (P. G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Geo. F. Suker (P. G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P. G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P. G.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wipperfurth (E. E. N. T.) | | A. G. Wipperfurth (E. E. N. T.) | | A. G. Wipperfurth (E. E. N. T.) |
| 1 P.M. | | Willis O. Nance (C. C. S.) | | Willis O. Nance (C. C. S.) | | Willis O. Nance (C. C. S.) |
| 2 P.M. | J. V. L. Brown (Inf.) L. J. Gardner (E. E. N. T.) M. H. Levensohn (Inf.) W. A. Fisher (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. C. Orcutt (Inf.) N. E. Kemmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) Wm. H. Wilder (Inf.) F. A. Phillips (Inf.) Wm. E. Young (Inf.) N. A. Young (Inf.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Richard Tivnen (N. W. U.) Alex. P. Horwitz (N. W. U.) S. L. McCright (C. C. S.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. J. Gardner (E. E. N. T.) Frank Gault (St. Luke's) Cassey Wood (St. Luke's) T. A. Woodruff (St. Luke's) J. B. Loring (Inf.) D. A. Payne (Ols. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Richard Tivnen (N. W. U.) Friends Lane (Rush) M. H. Levensohn (P. & S.) S. L. McCright (C. C. S.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) Frank Althoff (St. Luke's) Frank Brawley (St. Luke's) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. J. Gardner (E. E. N. T.) Frank Gault (St. Luke's) Cassey Wood (St. Luke's) T. A. Woodruff (St. Luke's) J. B. Loring (Inf.) D. A. Payne (Ols. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Richard Tivnen (N. W. U.) Friends Lane (Rush) M. H. Levensohn (P. & S.) S. L. McCright (C. C. S.) | E. V. L. Brown (Inf.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Kemmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) Wm. E. Young (Inf.) N. A. Young (Inf.) C. G. Darling (N. W. U.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Alex. P. Horwitz (N. W. U.) Richard Tivnen (N. W. U.) M. H. Levensohn (P. & S.) S. L. McCright (C. C. S.) | E. V. L. Brown (Inf.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Kemmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) Wm. E. Young (Inf.) N. A. Young (Inf.) C. G. Darling (N. W. U.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Alex. P. Horwitz (N. W. U.) Richard Tivnen (N. W. U.) M. H. Levensohn (P. & S.) S. L. McCright (C. C. S.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) Wm. E. Payne (Ols. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N. W. U.) Geo. T. Jordan (N. W. U.) Richard Tivnen (N. W. U.) M. H. Levensohn (P. & S.) S. L. McCright (C. C. S.) |
| 3 P.M. | W. Allen Barr (C. C. S.) Wm. E. Gamble (P. & S.) E. K. Findlay (P. & S.) Oscar Dodd (Inf.) | H. H. Brown (Ols. Med.) | J. E. Harper (P. & S.) W. Allen Barr (C. C. S.) Wm. E. Gamble (P. & S.) | Burton Hazeltine (County) | W. Allen Barr (C. C. S.) | Geo. F. Suker (P. G.) |
| 4 P.M. | W. F. Coleman (P. G.) | C. W. Hawley (P. G.) | G. F. Suker (P. G.) | C. W. Hawley (P. G.) | W. F. Coleman (P. G.) | Brown Passey (County) |

*Special operative eye clinics.

ABBREVIATIONS:

| | | | |
|--|---|--|--|
| C. C. S.: Chicago Clinical School, 819 W. Harrison Street. | County: Cook County Hospital, W. Harrison and Honore Streets. | Poli.: Chicago Policlinic and Hospi- tal, 174 E. Chicago Avenue. | Rush: Rush Medical College, W. Harrison and Wood Streets. |
| E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | Ils. Med.: Illinois Medical College, 182 Washington Blvd. | P. G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. | St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
| | Inf.: Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets. | N. W. U.: Northwestern University, 2431 Dearborn Street. | |

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

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NO. 4, NEW SERIES

Original Articles

ADDITIONAL OBSERVATIONS ON THE USE OF THE OCULAR TRANSILLUMINATOR (THE WÜRDEMANN LAMP).

By H. V. WÜRDEMANN, M. D.,

MILWAUKEE, WIS.

(Illustrated.)

Diaphanoscopy of the eye was at first restricted to the differential diagnosis of simple retinal detachment from that caused by intraocular growth. It was discovered that if a beam of light was passed through the eye sideways that any opaque object, like an intraocular tumor situated in the anterior half, for instance about the ciliary region (which is not seen directly by ophthalmoscopic examination), would obstruct the passage of such beam and cast a shadow, the other parts of the eye remaining translucent. This use of diaphanoscopy has been described in a number of recent papers on the subject, mostly by German authors. Sachs and others added to these observations the additional use of the method for detection of choroidal detachment and for examination of the eye by the direct method, to see the ciliary processes and the Purkinje's figures.

It was also discovered that diaphanoscopy was of considerable value for the detection of glaucoma, and in particular for the examination of the circumlental space. This method shows that this space is always smaller than normal in glaucoma, being even sometimes obliterated. An eye that is predisposed toward glaucoma has a small circumlental space. This phase of the subject has likewise been rather completely exhibited in recent papers, the only ones that I know of being by Americans.

In addition to these valuable findings the method and instrument have proven of considerable service in other respects. In the course of these examinations and in the experimental investigations which led to the design of my instrument, I have found many other uses. There have been a number of instruments devised for this purpose, both before and after I designed my model. The first was by V. Reuss, then came Gärtner, Birnbacher, Rochon-Duvigneaud Wolz, Leber and Sachs.

I may be pardoned for again giving a brief description of

the transilluminator designed by me. The instrument I have devised, of which I understand there are already more than 500 in use, is made mostly of hard rubber, weighs 30 grams, is 14 cm. long and 10 mm. in diameter, of the size and shape of an ordinary fountain pen, and is manipulated in the same manner. It consists of a handle, to one end of which the battery cords are connected; in the other end is a miniature *lens-capped* lamp, a very essential feature, for the illumination from this is three and one-half times that of the ordinary lamp, as the light is condensed right over the filament. Then comes a cylinder, in the end of which is a cone-shaped piece of hard rubber, through which passes a glass rod $2\frac{1}{2}$ cm. long and $5\frac{1}{2}$ mm. in diameter, which extends a fraction of a mm. beyond the rubber tip of the cone. The inner end of this comes in contact with the lens-capped lamp, and thus nearly all the light made by the lamp is conserved and is projected through the glass rod, coming out of the cone as an almost parallel beam. It is claimed that this little instrument, with its miniature five candle-power lamp and needing less than one volt of electric current, gives as great a light as the Brodingtonian apparatus of Sachs. Having so small a lamp and being made almost entirely of a slowly heating material, it does not get hot like the other instruments, notably those of Leber and Sachs, which are made of all metal. Then, again, these lens-capped lamps have a universal screw base and can be obtained from any electric supply house and are relatively long-lived and cheap. DeZeng has adapted my lamp to his set of instruments—a most convenient arrangement.

The use of the transilluminator for oblique illumination of the anterior part of the eye is much more satisfactory than the ordinary method of using a condensing lens to focus the light from a gas flame or electric burner. The pencil of light from the transilluminator is the only source of illumination, being a beam of even intensity with little of the diffrangent rays that we get from a condensing lens. Extraneous illumination does not interfere for the light is placed solely on the spot to be examined. Thus the search for minute foreign bodies and abrasions on the cornea, spots of pigment and deposits on Descemet's membrane is facilitated. I have many times demonstrated and removed foreign bodies and seen abrasions invisible to other means of examination. Small maculae—the scars of old minor injuries—stains from emery and iron are readily seen. Thus in the case of such men as iron workers who have frequently had minor injuries to the cornea, the lowered visual acuity resulting there-

from has been demonstrated to be due to small maculae in the vizual zone of the cornea.

H. Vuellers* has recently published a paper containing observations similar to mine—but my findings have been made independently, before I was aware of his publication. He used the Sachs' lamp. I am sure that the shape, size, non-heating qualities



Figure 1.

The De Zeng Instruments Comprising the Ophthalmoscope, Skiascope and Wurdemann Transilluminator.

and full illumination of my model renders it preferable to any of the others.

In operating for the removal of foreign bodies, and particularly in operations for discission of cataract, and even for the cataract or iridectomy operation itself, the focal illumination afforded by the instrument is of much value, for the form, size

*Neue, diagnostische wichtige Resultate bei Durchleuchtung des Auges mit der Sachsschen Durchleuchtungslampe. Zeitschrift für Augenheilkunde, September, 1907.

and non-heating qualities of the instrument allow it being brought very close to the operative area. Thus dissection of the capsule and post-operative membranes may be readily done. The finest membranes are easily seen and may be accurately dissected. Other uses for focal and oblique illumination might be remarked and will suggest themselves.

From my first use of the method of diaphanoscopy, I have noted with interest the appearance of the iris. The gross anatomy is well shown. The swelling of the iris and exudates therein in iritis and glaucoma are made visible; the detection of lack of retinal pigment and thinning of the iris which occurs after these diseases is shown. The thickness of pseudomembranes in iridocyclitis is demonstrated. It is of help in the study of synechia. Total occlusion of the iris may be often demonstrated in cases where the pupil does not react to mydriatics. Thus valuable information as to the best place to make an iridectomy is given, particularly where the synechia is not total, for then the iridectomy may be done upon a portion of the iris that is not adherent to the lens, and thus the danger of damage to the anterior capsule may be avoided.

All forms of lenticular opacities are well demonstrated; information as to the condition of tumors or foreign bodies behind the lens may be shown, as all cataracts are made translucent by diaphanoscopy, the pupil appearing illumined, although not so bright as where the lens is transparent. In secondary cataract, the different thickness of the various places is indicated by the brightness of the strata. In leucoma of the cornea the condition of the pupil may be elucidated by transillumination; foreign bodies in the iris, in the lens, and sometimes even in the vitreous may be seen by this form of examination.

It is unnecessary at present to go into further details or to cite cases coming under the above heading, in which this method has been used. I have made hundreds of these examinations and believe that transillumination of the eye is a necessary adjunct to the dark room examination in cases coming under the foregoing category.

THE OPHTHALMO TUBERCULIN REACTION.*

By FRANK M. BRAWLEY, M. D., CHICAGO.

This subject is presented at this time in order to stimulate the interest of ophthalmologists in a diagnostic method which promises to be of great importance to them. Thus far the work has been done principally by those interested in general tuber-

*Read before Chicago Ophthalmological Society, February, 1908.

culosis, but this reaction promises to be of fully as great value to those who are interested, especially in ocular tuberculosis.

To Wolff-Eisner belongs the honor of first introducing this measure and to Calmette the credit of elaborating the method of its practical application. Wolff-Eisner originally used a 10 per cent tuberculin solution but this proved to be too severe after trials upon horses, cattle, etc., and it remained for Calmette to make a 1 per cent solution of dried tuberculin, which produced a sufficiently mild reaction to be practicable. The term suspension, as used by Smithies and Walker, is incorrect, as the product is in reality a solution, not a mechanical suspension, the dead cell bodies having been filtered out during the preparation of Koch's old tuberculin. It is now possible to obtain in the market tablets sufficient to make 1 c.c. of the mixture. These are prepared by Parke, Davis & Co. They contain 10 mg. of dried tuberculin obtained by precipitating Koch's old tuberculin with 95 per cent alcohol. The preparation is also put up in capillary glass tubes of the sort used for the vaccine of smallpox.

In making the test one drop of the 1 per cent solution is dropped into the lower cul-de-sac near the outer canthus and the lid held away from the globe in order to allow the material to flow over the conjunctiva. The patient is instructed not to disturb the eye by rubbing it or by using any form of treatment. Unless under close observation the patient may be warned that his eye may possibly itch and that mucus may form and cause adherence of the lids, etc., and he may be asked to note the time of occurrence of the first positive symptoms. For convenience in recognizing a mild reaction the eyes should be compared at the time of instillation so that any difference may be easily noted. Within three to thirty hours the reaction occurs. It is a conjunctivitis of varying degree showing in the mildest forms, reddening of the caruncle and conjunctiva of the lower cul-de-sac with increased mucus secretion, which may dry along the lid edges and at the canthi, and from this picture on upward to great swelling of the lids and muco-purulent discharge. The general opinion seems to be that the procedure is devoid of danger and causes no lasting effects, subsiding usually in two or three days. Several schemes have been devised to register the varying degrees of reaction, but would seem to be superfluous, at least to ophthalmologists as the picture is merely that of an acute conjunctivitis only to be distinguished from one of bacterial origin by an absence of organisms in the secretions. The reaction is explained by the theories of Citron and v. Pirquet who agree that tubercle bacilli somewhere in the

body secrete material which reacts upon the receptors of the body cells everywhere, rendering them sensitive to tubercle toxins, so that all body cells are capable of producing antibodies when brought into contact with them. The instillation of the tubercular product furnishes the agent necessary to cause the cells to react. A similar reaction occurs in V. Pirquet's method of skin vaccination with 25 per cent tuberculin.

Smithies and Walker (13) report their results based on two hundred and forty-two cases in the clinic of Internal Medicine of Prof. George Dock, University of Michigan.

They believe that the variations in the published reports are due to a lack of uniformity in administering the tuberculin which, being really a suspension of cell bodies, requires especial pains in order to keep the suspension homogeneous and so secure equal dosage. The preparations of tuberculin also vary; there is difficulty in demonstrating the presence of tuberculosis clinically and then unknown conditions may be present which influence the reaction. They used the tablets made by Parke, Davis & Co., of Detroit, and from these made up a 1 per cent suspension. They obtained distinct reactions in 39 cases and doubtful reactions in 5 cases. Those cases showing the reaction, with the exception of 10 were proven clinically to be tuberculous. In no case of active clinical tuberculosis of any organ was a negative reaction obtained. Of the 10 cases which showed the reaction but no clinical tuberculosis, 3 had a history of previous tubercular processes and the rest were poorly nourished, syphilitic, chronic meningitic, clubbed feet, etc. One hundred and ninety-eight tests were negative, 6 of whom had been clinically diagnosed as tuberculous, although only one was suspected of having an active process. One hundred and twenty-six hospital patients with at least one disease other than tuberculosis, all gave negative reactions. Two cases reacted out of 76 supposedly normal adults, one of which was found to have an old tuberculous knee, and the other on examination showed strongly suspicious findings.

These authors, I believe, place too much stress upon the forms and degrees of the reaction. It is a conjunctivitis clinically and as yet no relation has been shown to exist between the degree of reaction and the extent of the tubercular process. All we need to know apparently is that the reaction is due to the tuberculin and for that purpose smears show absence of organisms and an excessive amount of mucus.

Seven of their cases reacted both to tuberculin injections and to the eye test, and positive clinical evidence of tuberculosis was obtained in each case.

Sydney Stephenson (14) made his tests on suspicious eye cases with the Calmette solution. Six cases of long-standing and relapsing corneal ulceration gave positive reactions. One case of recent phlyctenular keratitis gave a negative result. Three cases of choroiditis without other clinical evidence of tuberculosis gave positive reactions. Five cases of interstitial keratitis due to inherited syphilis gave negative reactions while three other cases without evidence of congenital syphilis gave positive reactions. One case of episcleritis with glandular enlargement, gave a positive reaction, while two others were negative. A case of tubercle of the iris gave a positive reaction, both to tuberculin injections and to the eye test which was made in the unaffected eye. A case of corneal tubercle reacted to the eye test, but more slowly to the tuberculin injections, three injections of .001 mg. being required to bring about a rise in temperature. Two cases of chronic iridocyclitis gave a positive reaction to the eye test. The author makes no mention of the general findings so that we are unable to decide whether the reaction was induced by the local ocular process or by an undiscovered focus of tuberculosis somewhere in the body.

H. Truc (7) used the Calmette solution in 23 cases, 4 reacted markedly and 4 mildly, the former had bacilli in their sputum, the latter had no clinical lesions. The remaining 15 showed no reaction. No bad effects were found in eyes in the presence of any diseased condition, not even in trachoma. The reactions occurred equally well in diseased or healthy eyes. There was no effect on a clinically diagnosed tubercular choroiditis with bacilli in the sputum and the ophthalmic-reaction was the same in the healthy as in the diseased eye.

Cohn (6) concludes, (1) using a 1 per cent tuberculin solution, when the reaction is positive it speaks with greatest probability for tuberculosis. (2) A negative result does not necessarily mean absence of tuberculosis as 50 per cent of the severe cases do not react. Light and moderately severe cases very seldom fail to react. (3) Typhoid cases frequently show positive ophthalmic-reaction to tuberculin, especially during convalescence. (4) For an indefinite period after the ophthalmic test an injection of tuberculin will cause a return of the eye reaction or in case it was negative, it may thus be made to appear. (5) In testing healthy adults generally there is a hypersensitiveness of the eye tested. Infants are not affected. In tubercular cases the reaction may even involve the eye not tested.

Bümel and Clarus (8) conclude after tests upon an abundance of material that in all cases where the reaction occurred the patient

was tuberculous; on the other hand, a negative result was not an absolute indication against tuberculosis.

In answer to Cohn they say that he used only a 1 per cent solution, while they have tried solutions up to 4 per cent, claiming that in this way a reaction means tuberculosis with certainty, not probably as Cohn says. The high percentage (60 per cent) of negative results in the severe forms of tuberculosis obtained by Cohn are explained by his failure to go higher than a 1 per cent solution. They believe it possible that a latent tubercular infection is present in those typhoids which react to tuberculin.

Schenck and Seiffert (10) review the work of Wolff-Eisner, Calmette, etc., and give the following theory of the reaction: They agree with Citron that tubercle bacilli in the body secrete material which reacts upon the receptors of the neighboring cells and renders them sensitive to tubercle toxins, so that they are able to produce antibodies. V. Pirquet by his skin inoculation has proven that this sensitiveness is shared by all the body cells including those of the conjunctiva. The authors used 1 per cent, 2 per cent and 4 per cent solutions, and in order to avoid the possibility of a reaction from a local cumulative action, the second eye was used for the second test in case the first proved negative. In 20 suspected cases 15 reacted as follows:

Six to 1 per cent solution.

Six to 2 per cent solution.

Three to 4 per cent solution.

Five showed no reaction.

In 52 cases in whom, clinically, tuberculosis was not found, 26 or 50 per cent showed positive reaction as follows:

Three with 1 per cent solution.

Eleven with 2 per cent solution.

Twelve with 4 per cent solution.

Twenty-six showed no reaction.

Their reactions appeared in from five to twenty-four hours. There were only 2 per cent of their cases with severe conjunctivitis and no ill effects. In 3 cases a mild phlyctenular eruption appeared at the corneal margin and in three others a mild facial herpes resulted. No rise in temperature was noticed at any time. They conclude that the ophthalmotuberculin reaction is undoubtedly of the greatest importance and will soon occupy a prominent place as a diagnostic agent in early tuberculosis.

Dr. F. Köhler (16) has tested the ophthalmotuberculin reaction on 169 cases, showing undoubted clinical tuberculosis, 50 of which had bacilli in the sputum and on 5 doubtful cases and

1 which was certainly not tubercular. Of the 169 cases of tuberculosis,

Eighty-three (51 per cent) reacted to a 1 per cent solution.

Sixty-six (41 per cent) reacted to a 2 per cent solution after the 1 per cent had failed.

Thirteen (8 per cent) reacted to a 4 per cent solution after the 1 per cent and 2 per cent had failed.

Eight (4.7 per cent) showed no reaction.

Of the 5 doubtful cases 2 reacted to the 1 per cent solution and the other three to the 2 per cent solution. The case which showed no clinical evidence of tuberculosis reacted to a 4 per cent suspension. Köhler believes that a large number of normal cases should be tested and also cases with tuberculosis of organs other than the lungs, before the final value of the reaction can be definitely established. His work will appear in detail later in the *Zeitschrift für Tuberculose*.

Baldwin (12) thinks that the mild or negative reaction of severe cases of miliary and well advanced tuberculosis is due to exhaustion of the reaction mechanism from excessive absorption of the toxin. His reactions found in supposedly healthy individuals occurred late and only after repeated or very large doses. Three cases noted stuffiness of the corresponding nostril and slight coryza. One severe reaction was accompanied by muscular pains suggesting a general response. Five cases were tested both by the injection of tuberculin and by the ophthalmic-reaction as follows: 4 were negative to the eye test and one showed a doubtful reaction to a 2 per cent solution: one was negative to an injection of 1, 3, 5, and 10 mg.; two were negative to 1 mg., one being that case showing the doubtful ophthalmic-reaction: one was negative to injections of 0.1, 0.5, and 2 mg.; the last was leptic and reacted to 5 mg., but not to the eye test.

Mainini (17) has tested 208 cases with the v. Pirquet (?) skin reaction and has used the ophthalmic-reaction in 100 cases. He concludes that the skin test is very reliable in all cases except the very late stages of tuberculosis and seems to be a better test for obscure and merely suspected cases than the eye reaction.

Wiens and Günther (18) sound almost the only warning note to be found in the mass of literature on the ophthalmic-tuberculin reaction, which is rapidly accumulating. They found that the eye test tended to exaggerate an existing conjunctivitis. An instillation into the eyes of a 3 years old child with spinal tumor brought on a chronic catarrhal conjunctivitis which lasted for months. Another case suffered from extreme conjunctival swelling with muco-purulent discharge and phlyctenules which had not entirely

disappeared three months after the instillation. One case showed hemorrhage into the conjunctiva. They found that even a 0.5 per cent solution was sufficient to produce, in a case of pre-existing mild conjunctivitis, pseudo-membranes, hemorrhages and keratitis which subsided in two weeks' time. They conclude that the test should not be made where a conjunctivitis, even though mild, exists although the ophthalmic-reaction itself runs the same course as in a normal eye.

Klieneberger (19) tested 61 cases and concludes that a reaction obtained by a second test upon the same eye is to be considered as hypersensitiveness of the conjunctiva only.

The author's experimental work has been very meager but is being continued, and wherever possible all controls are being made. Thus far the following cases have been tested, usually with a 1 per cent suspension:

Case I.—Clinical diagnosis, tubercular ulcer of eyelid, healed. Gave negative reactions to one 1 per cent and two 2 per cent solutions, instilled on successive days into the diseased eye. No general tuberculosis found but close family history.

Case II.—Kerato-iritis, showing no reaction to a 1 per cent solution. No control obtained.

Case III.—Rheumatic iritis with hemorrhage and exudate into the anterior chamber. No general evidences of tuberculosis. Reaction negative to 1 per cent solution.

Case IV.—Normal after exhaustive general examination. Reaction positive after 24 hours, redness of caruncle with excess of prolapsed skin inoculation made 10 days after the eye test. Three mucus which dried upon lid edges. Reaction positive to a conopsonic indices taken and all normal. One per cent solution used for eye test, of choroid.

Case V.—Choroiditis of both eyes with atrophy. No control. No reaction to 1 per cent solution.

Case VI.—Low grade uveitis with marked vitreous opacities. No evidences of general tuberculosis. Reaction negative with 1 per cent solution.

Case VII.—Bronchitis and subacute ethmoiditis. No evidences of general tuberculosis. Reaction negative to two trials with a 1 per cent solution.

Case VIII.—Rachitic child of 13 years. Kerato-iritis of one eye secondary to empyema of anterior ethmoid cells. Reaction negative to two trials with a 1 per cent solution.

Case IX.—Chorio-retinitis, severe both eyes. Vitreous opacities and descemetitis typical, especially right eye. Reaction

marked with some edema of lids. Second reaction positive eight days later. First reaction noted in eight hours and second in three and a half hours. Same eye used for both instillations. Injection of 0.25 mg. T. R. negative. General examination one year ago = possible low-grade tubercular peritonitis, but no present evidence of such a condition.

Case X.—Widespread chorio-retinitis both eyes, with hemorrhages into vitreous. Reaction negative to two trials with a 1 per cent solution. No general control.

Case XI. History of chronic sore throat and formerly pulmonary tuberculosis. Ulcer found 1 cm. diameter at base of tongue and anterior tonsillar pillar covered with pale granulations. O. T. 0.5 per cent solution = positive reaction of mild type in eighteen hours.

From a study of the reported cases it would seem that much work is yet to be done before the ophthalmo-tuberculin reaction and its relation to general tuberculosis is fully determined. Exhaustive eye tests with suspensions of various percentage strengths of tuberculin controlled by skin tests, tuberculin injections and the opsonic index for tubercle bacilli, must be made before we can decide upon the exact value of the procedure and its possibilities of harm to such a delicate organ as the eye, especially in the presence of the various ocular diseases. Second eye tests should be made in the opposite eye where possible, or in the same eye at long intervals, as the experience of the majority of observers seems to show that the test has a cumulative effect, rendering the eye more sensitive or possibly causes mechanical irritation if used too often in increasing dosage.

The effect of the ophthalmo-tuberculin reaction in apparently normal individuals also requires exhaustive study controlled by thorough painstaking general examinations.

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OPTIC NEURITIS DUE TO CHRONIC EMPYEMA OF THE FRONTAL AND ANTERIOR ETHMOIDAL SINUSES.

BY WILLIAM R. MURRAY, M. D., MINNEAPOLIS, MINN.

Patient, male, aged thirty-five years. Occupation, farmer. Referred by his family physician, July 11, 1907.

A diagnosis of sinus empyema had been made and the patient was referred to me for operation.

The subjective symptoms had been unusually severe; intense headache, dizziness, nausea, vomiting, gastric and intestinal disturbances extending over a period of one year.

Examination of right nostril showed pus in the middle meatus, and covering the anterior end of the middle turbinate bone; middle turbinate enlarged and oedematous. Left nostril no discharge of pus; middle and inferior turbinates moderately hypertrophied.

Examination of the nasal accessory sinuses showed chronic involvement of the right frontal, anterior ethmoidal, and maxillary.

On questioning the patient in regard to the condition of his right eye, he stated that his vision was much poorer in that eye than in the left, and that it had been bad for the past year.

Examination of the eyes showed the following: O. D. vision 20/100. No pain or tenderness on palpation of the eyeball; extra and intraocular muscles normal; ophthalmoscopic examination showed optic neuritis, retinal veins congested and edges of disk blurred. Visual field contracted for white and colors, and a small central relative scotoma. O. S. vision 20/20. Extra and intraocular structures normal; visual field normal.

July 11, date of examination, I resected the anterior half of a large and oedematous middle turbinate. July 13 I removed the anterior portion of the inferior turbinate, and made a large and permanent opening into the antrum, by removing a portion of the nasal wall of the sinus. One week later I did a modified Killian operation on the frontal sinus and anterior ethmoid cells.

Discharged from hospital one week after operation with vision O. D. 20/30. Four days later vision was normal, with normal visual field.

Involvement of the optic nerve, due to sinus disease, usually disappears rapidly after proper operative measures have been directed to the affected sinus. Fish¹, in his reference to published

cases, cites a case of Coppez's in which vision improved from $1/20$ to normal in eight days; Brawley's from $1/5$ to normal on the fourth day; Würdemann's from $1/6$ to normal in a few days; Mendel's, blind at time of operation, later had $2/3$ vision. He also refers to a case of Richet's in which, by opening the frontal sinus, vision was restored to normal in an eye blind for more than a month, and to a case of Fliess's, the patient being "able to read the finest print after being about blind for months." Black² reports a case, vision $6/LX$ returned to normal in four weeks, after probing the frontal sinus.

In the above case the onset of the optic nerve involvement dated back one year, the patient stating that his sight became affected one year before date of examination, and that it had been "bad" during that time. Improvement in vision dated from the time of operation on the frontal sinus and anterior ethmoid cells and was normal in ten days. Various writers have advanced different theories to account for optic nerve involvement in connection with sinus disease, and doubtless these different theories may each cause an optic or retrobulbar neuritis in individual cases.

It would seem that the posterior sinuses, sphenoid and posterior ethmoid, would be most likely to cause such a complication. Onodi³ points out the intimate relationship that exists between the accessory sinuses, especially the posterior sinuses, and the optic nerve, and to the great irregularity in the conformation of these sinuses. The same author⁴ shows that the posterior ethmoid cells frequently extend into the sphenoid wings, and that in all cases in which the optic canal is connected with the posterior ethmoid cell, the septum separating them is as thin as paper, and that the extremely thin bony partition may favor propagation of disease. He also states that fissures in the optic canal and in the posterior side wall of the sphenoid cavity may be the direct cause of perineuritis optica.

Schroeder⁵ refers to the extreme thinness (1.2 m.m.) of the bony plate between the posterior sinuses and the orbit, and also to the dehiscences, which may be present, so the mucous membrane of the sinus may be in apposition with the sheath of the optic nerve. Paunz⁶ states that eye affections may be caused by nasal affections in the following ways: "1. Through direct extension. 2. By way of the blood and lymph passages. 3. Of reflex origin." Cutler⁷ believes that intraocular disease, due to sinus involvement, should be regarded as exceptional and due to exceptional conditions such as anomalous arrangement of vessels or lymphatics. Fish⁸ states that the secretion in the sinus causes a

"passive orbital hyperaemia or engorgement, as the vessels, draining the mucous membrane lining the nasal and pneumatic cavities, drain principally into the vena ophthalmica." This is also the theory of Ziem. Fish⁹ later modifies the passive orbital hyperaemia theory and considers the circulatory disturbance as due to a vaso dilatation resulting from an irritation of the sympathetic by the secretion in the sinus.

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BINOCULAR EXOPHTHALMOS. RECOVERY.*

BY S. D. RISLEY, M. D., PHILADELPHIA, PA.

The following case of exophthalmos is presented to the Fellows of the College, not only because of the inherent interest in every case of binocular protosis but for the somewhat peculiar features of the disease and the difficulty in forming any satisfactory opinion of its cause.

Laura Best, a colored woman, aged 40, was referred to my Wills Hospital clinic, November 27, 1907, suffering from severe frontal pain, protosis of both eyeballs and a roll of dense infiltrated and oedematous conjunctiva below. Both lower lids were crowded away from the balls and the upper lids could be closed with difficulty.

There was no thrill, pulsation or bruit; no tachycardia or other evidence of Graves disease. There was but little if any limitation of the motility of the eyes except inward on the left side. Both the exophthalmos and the conjunctival oedema below were greater on the left side. The frontal pain began early in September, increased in severity and was soon followed by the protruding of the left eyeball which a month later began in the right also. At no time had she noticed noises in her head. There was no elevation of temperature.

The woman is well nourished and has always enjoyed good health. She is the mother of one living healthy child and has had one miscarriage, but no other evidence of syphilitic infection could be elicited. She does not appear to be the subject of any

*Presented to Fellows of Ophthalmic Section, College of Physicians of Philadelphia, December 17, 1907.

cachexia. There are no glandular enlargements. She was sent to Dr. Sweet for an x-ray study, the result of which is given in the following letter:

Dear Dr. Risley:

We made two plates from different positions, of affected side of Laura Best. On each plate is a distinct outline of the frontal sinus, indicating no affection of this region. On the portions of the plate corresponding to the ethmoid and posterior part of orbit, the outlines of the bony structures are not as clearly shown in shadow as is ordinarily seen in skiagraphs, but there is no positive dense shadow, such as might be shown by a collection of purulent material. I regret that I cannot give you a more definite report as to the ethmoid and sphenoid.

(Signed)

W. A. SWEET.

Electric illumination of the sinuses, first by myself and later by Dr. Joseph Gibb, showed the maxillary antrum and frontal sinus on both sides free from packing. When the illuminating lamp was placed in the vault of the pharynx there were shadows, as in the skigraph taken by Dr. Sweet, possibly significant of ethmoidal involvement but open to other interpretation than the presence of pus or other contents. The illumination of the ethmoidal cells is always difficult and probably more difficult than usual in the colored race where the bones of the skull are dense and thick. Inspection of the nose revealed an extraordinarily capacious attic on both sides which made examination of the part very easy. The anterior ethmoidal cells projected far forward and the anterior ends of the middle turbinates were wedged firmly between the bony wall and the projecting ethmoidal cells. A good sized trocar was forced into the ethmoid cells, but no pus or other significant contents could be withdrawn, nor was the free puncture followed by any subsequent discharge. While under observation and study in the hospital her pain has disappeared, but the exophthalmos has steadily increased on both sides and the balls have become firmly fixed. The protosis from the beginning has been straightforward. The vision in each eye was 6/30 at her first visit and there has been no further diminution. There is no signs of optic neuritis, no retinal hemorrhages, but the optic discs appear somewhat paler than when first studied. The corneal sensibility is not impaired, the media are transparent and the fundus of both eyes approximately healthy. The pupils react normally to light.

After the study which has been outlined was completed she was placed on rapidly ascending doses of potassium iodide and mercurial innunctions. After a week of this treatment she feels

better. the proptosis is apparently diminishing and she has regained some slight movement of the balls.

It is obvious that the problem presented is primarily one of diagnosis. The objective signs exclude with great probability a considerable group of well known causes of exophthalmos. Both the history and symptom complex exclude exophthalmic goiter, the most frequent cause of binocular exophthalmos. Then, too, the binocularity of this case, the straightforward proptosis, the rapid development, the freedom from cachetic signs, the absence of any palpable nodules under the orbital rim, render the presence of an orbital neoplasm extremely doubtful. The skiagraph and illumination of the contiguous sinuses seem definitely to exclude from consideration any disease of the frontal sinuses or the antrum of Highmore. But even without the evidence afforded by illumination it is highly improbable, certainly very rare, that both eyes should have been affected by disease in these cavities. Clinical experience shows that the proptosis produced by any of these causes is rarely binocular and that the protruding ball is forced not only forward but to one side. One doubt still remains as to the possibility of sinus involvement. I do not believe that the ethmoidal cells have been excluded with certainty. The remaining possibilities are, first, a chronic orbital cellulitis of which there have been none of the usual signs; second, some intracranial condition which prevents the uninterrupted intake of blood from the ophthalmic veins situated, probably in or near the cavernous sinuses. It is improbable that a thrombus of these sinuses can be present without occasioning still more serious consequence. That they are involved is made probable by the occurrence of the blocking of the orbital circulation, first on the left side, then its extension to the right, after a distinct interval of time, the usual history in thrombus of the cavernous sinuses. If the improvement under mixed treatment continues the opinion would be suggested, notwithstanding the absence of any history of syphilis, that the impaired circulation through the cavernous sinuses was brought about by a gumma or node at the base situated in its immediate vicinity.

This patient, together with the history as above related, were presented to the Ophthalmic Section of the College of Physicians of Philadelphia, December 17, 1907. She was discharged February 1, 1908. The proptosis of the eyeballs had disappeared, she suffered no pain, the fields, acuity of vision and ocular motility being restored to normal conditions. The blurred outlines "of the bony structures in the region corresponding to the ethmoid and

posterior part of the orbit as shown by the skiagraph" seem to confirm in some measure, the opinion that a node was present in this region. Further confirmation is found in the rapid recovery under the iodide of potassium and mercurial inunctions.

SUPPLEMENTARY REPORT ON A CASE OF PROBABLE CEREBELLAR TUMOR TREATED BY TUBERCULIN INJECTIONS.

BY H. B. YOUNG, M. D., BURLINGTON, IOWA.

I showed to this society, as will be remembered, in May, 1906, a girl aged 10 who had fundus lesions simulating albuminuric retinitis, and for whom a tentative diagnosis of intracranial neoplasm had been made because no kidney lesion could be found. In November, 1906, I made a preliminary report on the effect of treatment, and in May, 1907, I again brought her before this society to show the progress made and ask if it was advisable to go back to the injections which were discontinued in the preceding February. The child had by this time regained the 17 lbs. lost and had an additional 8 lbs. to the good. Her reflexes had in part returned; she walked with slight stagger; and she saw well enough to get about fairly well, V. = 3/75 (left). The edematous patches, pigment masses, glistening spots, and hemorrhages had disappeared from the fundi, but the discs were still fuzzy and the left macula retained the stellate figure. This stellate figure, however, was made up of discrete dots radiating mostly upward instead of lines as formerly.

Two years having now elapsed since the first manifestation of trouble, and one year since she has had any treatment, it seems proper to add this further note on the condition of the patient, the record of a recent examination:

Weight 105 lbs., and all body measurements increased a little more than the average for the age; vigorous in mind and body; active on her feet, too active for her amount of vision, for this prevents accurate location and she stumbles over and runs into things; vision R. is nil, L. 3/70+; no change in the past six months, and the field is more characteristic of glaucoma than of atrophy (nasal abolished up to and including part of the macula, and reaching up and down so that an irregular oval is left down and out not excepting 60 degrees).

The fundus changes seem remarkable under the circumstances. The discs are white and the vessels small, just as would be expected after typical choked disc which was never in evidence;

but scarcely a trace is to be found of the tremendous retinal inflammation observed, and in which the choroid must have participated, for the pigment masses can hardly be accounted for otherwise.

The case it seems to me is doubly interesting: First, because of the rarity of cure under such treatment; second, because the method employed was so much at variance with our present idea of correct dosage, based upon opsonic calculation.

What became of the 499-500 m.g. in excess given with every injection except the last (February 5, 1907), which was 249/500 in excess and the only one followed by rise of temperature?

From present appearances this will be the final report.

A SIMPLE AND EFFECTIVE INSTRUMENT FOR CAUTERIZING CORNEAL ULCERS.

By FRANK C. TODD, M. D.,

Professor Ophthalmology and Otology, University of Minnesota, Minneapolis, Minn.

At his clinic in Philadelphia following the meeting of the American Medical Association last June, Dr. de Schweinitz, among many other valuable hints given, showed a Wordsworth cautery instrument which was new to those present, and of such value for the purpose intended that I take occasion to describe it herewith.



The cut illustrating the instrument which is here shown explains the shape sufficiently. This instrument as modified was made for me by F. A. Hardy & Co. The platinum cauterizing point comes out from the bulb at an angle and permits of a better view of the ulcer during the operation, and at a convenient situation on the bulb there is a blunt protuberance. The bulb is made of copper and the point of platinum. The bulb and point will remain sufficiently hot to cauterize for several minutes after the bulb has been heated to a cherry red over a flame. The point may be used to cauterize a small surface and the protuberance may be touched upon the surface of the ulcer when a large area is involved. The advantages of a small hand instrument like this over the cumbersome galvano cautery apparatus and also over a small probe are self evident.

Reports of Societies

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting held February 11, 1908, with the president, Dr. T. A. Woodruff, in the chair.

Symposium on Tuberculosis.

Dr. Chas. Beard discussed the *Diagnosis of Extra-Ocular Tuberculosis*. Adenopathy, he said, is diagnostic in 80 per cent of the cases; tuberculin is valuable only when tuberculosis elsewhere can be excluded; the ophthalmo-reaction of Calmette too often is of no value; tissue sections are unreliable; finding the tubercle bacillus and inoculation of animals are positive evidences of tuberculosis.

Diagnosis of Intra-Ocular Tuberculosis.

Dr. Albert Bulson believes that many intractable cases of uveitis, heretofore not to be diagnosticated, will be found to be tuberculous. He also discussed the various forms of tuberculosis in the other intra-ocular structures.

Tuberculin and Ophthalmo-Reactions in Ocular Tuberculosis.

Dr. Frank E. Brawley reviewed the literature and reported his personal experiences with these diagnostic agents. He said that much work must still be done before the relation of the ophthalmo-reaction to general tuberculosis can be determined. The test seems to have a cumulative effect. He also mentioned the possibilities of harm.

Therapeutic Use of Tuberculin in Tuberculosis of Eye.

Dr. E. V. L. Brown described the von Hippel method of treatment.

Supplementary Report on a Case of Probable Cerebellar Tumor Treated by Tuberculin Injections.

Dr. H. B. Young stated that his patient first noted symptoms two years ago, and had been under treatment now for one year. The discs are white and the vessels small. There is now no trace of the tremendous retinal involvement observed at first. The case is interesting because of the rapidity of the cure.

Discussion.—Dr. John C. Hollister (by invitation) said that surgeons have been endeavoring to determine the relative value of these various diagnostic procedures. Wolff-Eisner, who claims

the so-called Calmette reaction as his own, says, in the *Muenchner Medizinische Wochenschrift*, January 14, 1908, that this should be called the conjunctival reaction. In manifest cases of tuberculosis, the method gives relatively frequent negative results. It is a method which is of value as an adjunct to clinical diagnosis. He advises the use of very dilute solutions, not stronger than 1:100,000, because too strong reactions are caused by stronger solutions. A one per cent solution of Koch's old tuberculin in sterile physiologic salt solution is best. The glycerin reaction makes no difference in the reaction. Calmette uses a one per cent solution of a glycerin free preparation precipitated by alcohol.

Dr. Hollister mentioned 102 cases in which the skin test, the Wolff-Eisner test and the opsonic index were studied by Dr. Mary Lincoln, with the following results: Skin cases, total 50; negative 11, positive 39, or 78 per cent, which compares favorably with von Pirquet's results. Wolff-Eisner test, 55 cases; negative 8, positive 47, or 85 per cent. Opsonic index, taking two or three out of four indices made on alternate days, if 2 are out of the normal index, between .8 and 1.2, there are 37 per cent; if one is out of the normal, there are 70 per cent. Of 32 non-tuberculous cases, the skin was positive in 3 and negative in 29, or 91 per cent. So far he has not found any cases that are not tuberculous that gave a reaction. Total 34 cases, all negative; opsonic index, 71 per cent. So that the eye reaction is more positive than either the von Pirquet or the opsonic index. Of 11 negative skin vaccinations, one gave a negative eye test, and two a very doubtful eye test. Of the eight negative eye tests, four of a series, one was a case of cured hip disease; one, miliary tuberculosis; one, uncertain diagnosis; and one, unsatisfactory instillation. The amount and quality of tuberculin used, the age of the patient and his resistance are factors to be considered. There are many different kinds of tuberculin of various strengths, and the product varies from bottle to bottle, and the individual bottle may vary at different times.

As to the eye reaction, German authors have divided it into reactions one, two and three, mild, strong and intense; others into mild and strong, according to the conjunctiva, the amount of injection, surface covered and subjective symptoms, such as feeling of sand in the eye, some itching and pain; pain back of the eye or radiating up toward the forehead, and lachrymation, nausea, vomiting and increased temperature, depending on the suscepti-

bility of the patient and the dose given. A child reacts stronger than an adult perhaps because of the fact that it has more lymphoid tissue in the conjunctiva. The time of the day when the test is made must also be considered. Of course, a clinical diagnosis of tuberculosis may be doubtful, unless the germs are found, even when histologic specimens are typical. The opsonic index entails a consideration of the leucocytes; what they are doing. Although it seems to be fairly reliable as to the patient's condition before anything is done, after the tuberculin has been given and the index has been changed, or the patient is inoculating himself, it is impossible to know what other reactions have taken place.

Dr. Thomas Faith cited a case of typical trachoma with a pannus and with enlargement of the preorbicular glands on the affected side which reacted to tuberculin, both general and local. One case reported by Brunkiewicz in which tubercle was developing for several years, resulted in secondary glaucoma. Inoculation of the eye and specimens also showed tuberculosis.

He thought that the value of the various methods of diagnosis is open to question. Out of seven cases in which the ophthalmo-reaction was studied, five gave clinical evidences of tuberculosis, with tubercle bacilli in the sputum. In the remaining two cases the clinical evidences were suspicious, but in none was a reaction obtained by the ordinary methods suggested. In one of his own cases, a typical phlyctenule, with enlarged cervical glands, there was no reaction. Other cases of Dr. Swan gave a typical reaction with no bacilli in the sputum. Dr. A. R. Elliott and Dr. E. Lachner made similar observations. Dr. Lachner failed twice with one preparation of tuberculin, but succeeded with another.

The belief at present, he said, is that phlyctenules are tuberculous in the majority of cases, but, then, not only the bacilli but their toxins and other bacilli may cause tuberculosis and similar processes.

Dr. Wm. E. Gamble referred to a case he reported some years ago conjointly with Dr. Brown. The feature that was most prominent in that case was the harm that large therapeutic doses did, locally and generally, and the value of small doses. He suggested that track be kept of the patient's general condition during the treatment as an index of what is being accomplished.

Wright, he said, in his last paper mentioned that he had discovered that all of his injections were 1/10,000 mg. instead

of 1/2,000. This mistake had been made by the manufacturer in putting up the container. So that this belief in the value of small doses is a general one. The Ehrlich side chain theory, if correct, explains this point very well. Wright treated an ulcer of the leg for a long time without any result. Later he injected locally around the ulcer, and it healed promptly. From that observation he draws the conclusion that there are parts of localized lowered resistance to the germs, and that by treating the particular part he may get results, while if treating systematically he would fail. Dr. Gamble wondered whether some cases of ocular tuberculosis would not respond to treatment better if subconjunctival injections of small amounts of tuberculin were given. If tuberculin is good for anything, it is for a local affection, and as more than 50 per cent of the eye lesions are localized or latent in the eye, they are especially amenable to this treatment.

Dr. Wm. H. Wilder thought that these methods offered a means for differentiating some eye lesions heretofore classed as idiopathic, in which there is no well defined etiologic cause. But the question that concerns ophthalmologists most is, where is the lesion; and until this can be answered, little will have been gained. Therefore, any test, to be of value must give a local as well as a general reaction. Then there is something definite to go on. In his experience with different tests he has demanded such results, otherwise he felt that there was no positive evidence to show that the lesion was ocular. It is well known that many of these conditions classed by von Hippel as tubercular do not show the clinical features of tuberculosis. There are no tubercles in the iris or choroid, but only a muddy vitreous, which is so dark that one cannot get the red reflex, and it is impossible to make a diagnosis of tuberculosis. Probably, he said, some of the lesions the result of tuberculosis may be caused by toxins and not by the germ, such as some forms of serious iritis or cyclitis.

He has subjected a number of patients to the ophthalmoreaction recently, and in two there were evidences of distinct phlyctenular keratitis, with ciliary injection, photophobia and lachrymation, but the other eye was perfectly clear. Putting one drop of a one per cent solution into the normal eye gave a pronounced reaction. In any case in the regressive stage one can get a very pronounced reaction by putting tuberculin into the unaffected eye. In both of these patients, children, there was a very marked lymphadenopathy. One child had a postcervical

gland as large as a hazel nut. In this case there was a general as well as a local reaction, and there was a distinct enlargement of the postcervical glands after the reaction: not so in the other case. He has used this method in three cases of phlyctenular keratitis with a positive reaction in two cases and a negative reaction in one case, which raises the question whether these cases may not be tuberculous. He has long suspected this, but has been inclined to think that lymphadenopathy, more or less general, may exist without it being tuberculous, and that we might still have to use the term struma to explain these cases. If these cases of phlyctenular keratitis should prove to be tuberculous, one can hardly say that they are so histologically, and they have always been negative so far as the germ is concerned.

Dr. Worthington reported 22 cases, with a positive reaction in 14 and a negative reaction in 8. In the latter the test was made two or more times at intervals of one or two days. The reaction was obtained in from three to twenty-four hours. In the first series of cases sterile water was used, and in the others salt solution. In making the test, it seems necessary that the inflammatory condition be unilateral in order to avoid mistakes. In one case of very severe reaction a general conjunctivitis was set up in twenty-four hours, and it persisted for ten days, showing the necessity of making a thorough examination of the eye before the test is made. The patient complained severely of diplopia in this eye, and also of partial loss of vision, found to be due to a refractive error.

Old tuberculin should not be used, and it is essential that great cleanliness be observed or the test will be of little value. In the case where the physical findings and clinical history were those of tuberculosis, the ophthalmo-reaction was positive. Of course, he said, this does not indicate that the tuberculous condition was in the eye only.

Dr. Henry Gradle said that in our knowledge of tuberculosis of the eye we can distinguish three stages. At first it was considered to be an exceedingly uncommon, exceptional occurrence. Then it was shown that half of them were typical masses in the external and internal parts of the eye, and we became conversant with actual tuberculosis of the conjunctiva, iris, sclera and uveal tract. But even then it was supposed that these lesions are not very frequent. Now, however, it has been shown that the eye is not nearly as exempt from tubercular involvement as we formerly considered it to be, only that many of the lesions are not typical.

even in structure, and differ from tuberculosis elsewhere in the body in the tendency to healing.

It has been shown that various forms of scleritis and uveitis, even of comparatively benign nature, are due to tuberculosis, but it has likewise been strongly suggested that there are other eye affections of tubercular origin that are not due to the presence of the bacillus itself in the ocular tissues. The two affections he referred to particularly are some forms of iritis and phlyctenular conjunctivitis. Von Mikel, more than any one else, has claimed that iritis occurs more frequently in tuberculous individuals than in others, and tuberculosis of the lungs figures as a more predisposing cause than syphilis. Dr. Gradle's observations have not been tabulated sufficiently to come to conclusions, but he has gained the impression that iritis, when not referable to syphilis or other well recognizable etiologic factor, is often associated with tuberculosis on other parts of the body. Of course, the mere presence of tuberculosis elsewhere is not definite evidence that the iritis is of tuberculous origin, but the frequent coincidence makes such a supposition very probable.

Another form of iritis of tuberculous origin, which is a little more definite than the tuberculous variety, is phlyctenular keratitis or kerato-conjunctivitis. There is no reason to assume that the bacillus itself is present in the tissues; in fact, the clinical history of most of these cases in the earlier attacks, speaks against the existence of a bacillus in the eye, but not against toxins or transplanted dead bacilli, as some of Loebe's assistants have shown.

Dr. Gradle has found lymph nodes, presumably tuberculous, or those ordinarily termed scrofulous, almost invariably present, if sufficiently sought for; and hence the few instances in which these nodes are not palpable to the finger in the tissues of the neck are not exceptions to the rule. We must assume the existence of tuberculous focus elsewhere, probably in the bronchial lymph nodes. Also the clinical history of phlyctenular conjunctivitis agrees so fully with manifestations of scrofula in general that the parallelism is strongly suggestive.

After tuberculin was introduced, Dr. Gradle tested four cases, all of which reacted generally, and one of them locally as well. This latter patient did very poorly. There may have been actual tuberculosis of the cornea in that case. The other three cases apparently were benefited. Dr. Gradle's treatment of cases which he has been able to follow has since then been based on the as-

sumption that conjunctivitis of phlyctenular variety is due to scrofula or tuberculosis of lymph nodes, and all general measures that can influence that condition favorably have seemed to possess a decided influence in preventing relapses of this condition.

One observation recently quoted in a German journal is of interest in connection with the ophthalmo-reaction, viz., that this reaction, if negative at the first trial, will prove positive in the same eye after about fourteen days, and even in instances in which tuberculosis cannot be demonstrated or even reasonably suspected. Evidently in these cases the tissues are hypersensitized so that a reaction will appear later. But such a reaction, in the same eye, does not indicate tuberculosis. It has also been shown that the eye which reacted not at all or very mildly, reacted without another instillation about a week or ten days later, when the old tuberculin was injected subcutaneously as a test, even when there was no general febrile condition produced, showing that hypersensitiveness of tissues can be produced merely by the presence of toxins placed artificially into the body without the existence of toxins in the body. A second test, therefore, made in the same eye after a lapse of days, does not seem, at present a clinical indication of actual tuberculosis.

Dr. E. V. L. Brown referred to 23 cases studied in the Axenfeld clinic and reported in the *Klinische Monatsblaetter*, January, 1908, in which both methods were tried. In nine the Calmette was positive, whereas the subcutaneous test was positive in all. So that the Calmette test is not as far reaching or reliable as the subcutaneous test. Oversensitization is also discussed. The conclusions are in favor of the limitation of the Calmette reaction, and it probably has not a great place in ophthalmology. When used in the healthy eye, there is an absence of a local reaction when it is so absolutely essential to have this reaction. The test has no great significance in proving the presence of tuberculosis or syphilis which may co-exist.

Dr. Chas. Beard stated that extra-ocular tuberculosis is unique in that it offers opportunity for the most positive and invaluable means of diagnosis. A piece of the tissue may be excised and studied in various ways in order to show the absence or presence of tuberculosis.

Dr. Albert Bulson, Jr., said that the more recent development of these methods will permit of diagnosing some of the more obscure lesions of the eye, more so than has been possible heretofore, and that many of these lesions will be found to be

tuberculous in character. Like all new methods, these must go through the stage of trial and experimentation before their definite value can be established. The technic of these methods will be improved and with the increasing number of reports, definite conclusions will be possible. Personally, he prefers to rely for diagnosis on the injection of tuberculin rather than on the ophthalmic reaction.

MORTIMER FRANK,
Secretary.

OPHTHALMIC SECTION, ST. LOUIS MEDICAL SOCIETY.

Meeting of November 13, 1907.

The Vice-chairman, DR. BALL, in the chair.

Congenital Defect of Abduction with Retraction of the Globe in Adduction (Patient).

By Dr. John Green, Jr. This case is a typical example of that peculiar congenital anomaly of the ocular muscles in which the globe is retracted into the orbit in adduction and comes forward and is restricted in abduction. It is the second case I have encountered of this rare condition of which there are only about sixty cases in the literature.

DISCUSSION: Dr. Alt stated that recently he had had occasion to see a case which probably had the same congenital cause. This patient could not raise either eye above the horizontal line; attempts to raise the eye provoked a nystagmus.

A New Attachment for the Skiascope (Demonstration).

By Dr. E. H. Higbee. In nearly all instruments for measuring the refraction of the eye, a chin rest is provided for the purpose of keeping the patient's eyes in one position. This is a mistake which Dr. Higbee has endeavored to obviate by constructing an eye-piece, much the shape of an eye-cup; when you place the patient's eye inside the cup he will keep it permanently in the one position. This attachment has been made for the skiascope. The cup is attached to one end of a flat spring, the other end having a lug which drops into small holes on the skiascope disc. These holes are placed in such a position that the lug on the spring drops into them as you turn it. The eye-cup, being on the other end of the spring, comes exactly opposite the lens each time. In this instrument the lenses are much smaller ($\frac{3}{8}$ -inch in diameter) than

those in the ordinary skiascope, but by having the eye permanently fixed the results obtained are just as good as with the larger lens and the work can be done with just as much facility. Another advantage of the eye-cup is the fact that it excludes all rays of light except those which come from the skiascope mirror.

This is an inexpensive attachment which can be made for any skiascope in which the lenses are inserted around the margin of a circular disc. The middle of the spring is bored out in such a manner that it can be attached to the axis upon which the disc turns.

DISCUSSION: Dr. J. Ellis Jennings stated that he thought Dr. Higbee's model a very convenient arrangement; its distinct advantage consisting in the fact that the eye shield excluded all light except that coming through the pupil.

Congenital Aniridia with Cataract (Patient).

By Dr. John Green, Jr. E. J., 26 years old, male, native of Missouri. Family history absolutely negative with reference to any ocular defect. "Something queer" was noted about the patient's eyes at birth. Vision had never been good, but up to the age of fifteen the patient could see sufficiently well to distinguish the larger letters of the school book by holding it very close to the face. The left eye has always been the better one. About three years ago vision began to fail in the right eye and within the past year in the left also. There has never been any definite ocular pain, but at times a vague aching in the temples. Examination shows a clinically complete absence of both irides. Both anterior chambers are shallow; in the right the lens comes forward almost to Descemet's membrane. Both lenses are cataractous, the right more opaque than the left, and tremulous. There is horizontal nystagmus. Both corneae measure 10 mm. in diameter and present a delicate peripheral infiltration in the deeper layers; there are also a few pin-head spots of infiltration nearer the center. The eyes are kept half closed. After eserine both chambers become deeper and one can see the circumferential space and fibers of the zonule of Zinn. The left lens is densely opaque centrally and presents capsular opacities as well as changes in the lens substance in the periphery. R. V. = perception of light, L. V. = fingers (uncertainly) at one foot. On needling the right lens there was a gush of soft lens substance that sank to the bottom of the anterior chamber. After operation tension was somewhat raised, but lowered under eserine salicylate and dionin.

Tension is now equal on the two sides, but slightly plus. R. V. with plus 13, sph. = 16/120.

DISCUSSION: Dr. Saxl stated that he had seen two cases of aniridia. One was a man with aniridia and cataract who was operated upon by needling. The second case was a boy who had complete bilateral aniridia. His vision was better than one would expect.

Dr. Green asked for opinions of members as to the future treatment of the operated eye. Tension in the operated eye was now about equal to that in the unoperated eye. These cases bear operation badly. Iridocyclitis and glaucoma are the complications most to be feared.

A Case of Homonymous Quadrant Anopsia.

By Dr. Lewellyn Williamson. Patient, a healthy man of sixty, came to the eye clinic, Washington University Hospital, October 15th, saying that he was having some difficulty in reading; that only a part of the line was visible and that when he looked at objects he saw only part of them; when looking at a horse and wagon, for instance, he would see the horse but not the wagon. At times he saw flowers, butterflies, etc., before his eyes.

R. V. = 15/30, with plus 0.25 sph. = 15-24. L. V. = 15/30, with plus 0.50 sph. = 15/15. P. P. = Snellen 1.5 at 30 c.m. With plus 3.25 and 3.75 D. S. for right and left eye, respectively, read smallest Jaeger easily at 33 c.m. Field showed a perfect homonymous quadrant anopsia. There was an entire absence of vision down and out in left field and down and in right field. These defects were symmetrical, involving the entire field between the 75th and 180th meridian, up to the median line. In addition the right field was somewhat contracted in its temporal half.

Left fundus showed nothing abnormal except some evidences of arterio-sclerosis (kinking of a vein where crossed by artery, etc.). Right disc showed a peculiar abnormality, probably congenital; the upper two-thirds being much darker than the lower one-third and the two parts were separated by a distinct sharply drawn line. Balance of fundus normal.

A review was given of the work done by Henschen, Wilbrand, Mills, and others, in tracing the visual pathway from the retina to the visual cortex. The latter was believed by most investigators to be in region of the calcarine fissure, but a case reported by Beeyer and Collins would seem to show that the Cuneus is also part of the visual cortex. The theory of partial decussation of

fibres in chiasm, first advanced by Joseph and Carl Wenzel, in 1812, was established by cases reported by Woinow, Hirschberg, Uhthoff, Schmidt-Rimpler, and Warrington and Dutton. This is contrary to views of Kolliker, Mandelstamm and von Michel who believe in a total decussation. Fibres from each quadrant of the retina form separate bundles in nerve, chiasm, tracts, primary centers, presumably in optic radiations, and end in separate centers in region of the calcarine fissure. Research of the literature seems to show that most quadrant anopsias are due to lesion of the cortex. Usual result of lesion in optic nerve is amaurosis; in chiasm bitemporal hemianopsia; in tract and primary centers *complete* homonymous hemianopsia; and if the lesion is in primary centres this hemianopsia is usually complicated by hemiplegia and hemianesthesia of the same side by reason of involvement of fibres passing along internal capsule and pedunculus cerebri. Careful but unsuccessful effort was made to elicit the Wernicke hemianopic pupil inaction symptoms. Its absence speaks against the lesion being in tract or primary centers.

Von Monakow, Schmidt-Rimpler, and Mills, are all of the opinion that incomplete hemianopsias are due to cortical lesion. Lesions in optic radiations are usually accompanied by symptoms of sensory aphasia, such as alexia, dyslexia, and paraphasia. Only symptoms in case presented, besides the anopsia was the hallucinations. These hallucinations are common accompaniment of quadrant anopsias and are probably due to irritation of non-visual centripetal fibres which, in passing from corpus geniculatum to cortex intersect the visual fibres.

Usual causes for hemianopsia are hemorrhages, embolism, aneurism, abscesses, and tumors. Because of sudden onset and the fact that the man has arterio-sclerosis, the author is inclined to think present case due to small hemorrhage or embolus in region of calcarine fissure.

DISCUSSION: Dr. John Green, Jr., stated that in this connection the history and ocular findings of a patient with an old head injury, seen recently in consultation, might be of interest. This was not a case of quadrant anopsia, but of symmetrical homonymous defects in the fields.

P. S., age 24, male, single. Ocular examination November 11, and 13, 1907, in consultation with Dr. W. W. Graves.

OCULAR HISTORY—Has always been near-sighted: left eye has diverged all his life. States that vision in left eye is much worse than in right and has always been so.

EXAMINATION.—Patient fixes with right eye and has a decided tendency to hold head with chin down and to left. O. S. diverges 15 degrees and turns down a little. Left upper lid droops slightly. In primary position there is constant rotary nystagmus counter-clockwise. Dextroversion is unrestricted on both sides; the rotary nystagmus increases in amplitude, but not in rate. On levoversion the right eye lags a little and the rotary nystagmus changes to clockwise. The lagging of the right eye is due apparently to weakness of the right internus and accounts for the position of the patient's head in fixation. On looking up and to the right the rotary nystagmus changes to clockwise. Up and to the left the rotary nystagmus changes to clockwise. On looking straight down nystagmus becomes horizontal, as is the nystagmus down and to the left. Nystagmus down and to right is more marked than nystagmus down and to left. There is less resistance on the left side to passive opening of closed lids.

Left palpebral fissure 8 mm. Distinct weakness of levators on both sides. R=L. Pupils 4.5 mm. Reactions, direct—right prompt, left sluggish. Consensual—right sluggish, left prompt. Right vision 16/50; left vision 16/192. Right with minus 3.5 sph. vision 16/19. O. S. V. not improved by plus or minus spherical or cylinder.

OPHTHALMOSCOPE.—The right eye shows a large myopic conus down and out. In the left eye there was a large coloboma of the macular region. The form fields show homonymous sector defects.

By Dr. W. W. Graves:—The case just reported by Dr. Green probably has but little bearing upon the case reported by Dr. Williamson; but we have reason to assume, in the latter case, the presence of a lesion in the left occipital region and the incompleteness of the form fields bears this out. Such a thing as a complete homonymous anopsia due to a cortical lesion is practically unknown.

The patient is a young man of 21 years, with a healthy parentage and negative family history. He had one epileptic seizure at 12 years of age followed by a period of seven years' freedom from attack. Then, following an attack of typhoid fever at 19, he began having fits and has had them more or less frequently ever since. He presents a right sided hemiplegia with a lessened growth of the forearm and hand and a slightly lessened growth of the right lower extremity. The mother states that as an infant

he was apparently normal, but she noticed at birth that the two sides of the face were not exactly the same and when he learned to walk he dragged one extremity. We had here an infantile cerebral palsy. Since there was no evidence of any illness, we must assume that it was due to a birth trauma or an antenatal condition. Epilepsy is frequently associated with infantile cerebral palsy, but this child did not develop epilepsy until his twelfth year. When he was about nine years of age, he was thrown from a bicycle and was unconscious for several hours and complained of pain in the head for considerable time after that. Then it was noticed that there was a dent in the left occipital region that his mother had never noticed before. Whether in this case epilepsy was due to the cerebral palsy or to the injury is a question. It will be remembered that the boy was about nineteen when his epilepsy recurred. Epilepsy in cerebral palsy usually occurs in the early periods of life and there is no reason why it might not develop in this case or even be more apt to do so since he had had the head injury. He has well-developed skull and is intelligent. In the left occipital region at a point about an inch and a half from the middle line is the center of a distinct depression in which you might place your finger tips. It is such a depression as you might expect from a blow over that locality.

What is particularly characteristic of hemianopsia of cortical origin is its incompleteness, and we are justified in assuming that the fall did produce this depression in the skull and that his visual cortical centers have in some way been interfered with, hence we get a characteristic defect from a cortical involvement of the visual area. We note a striking contrast between these fields and Dr. Williamson's. A quadrant anopsia ending at the middle line is very rare indeed. Such defects are particularly characteristic of lesions involving the optic tract itself or of lesions involving the external geniculate body. Therefore, from the fields alone we would be more inclined to believe that the lesion, whatever its nature may be, is either in the tract itself or in the external geniculate body. It would be very difficult to conceive how a vascular condition that Dr. Williamson assumes to be the cause of the condition in this patient would confine itself to the calcarine fissure alone. Assuming that it were an embolism, a thrombus or the bursting of a blood vessel in the calcarine fissure, we would expect to find a defect neither quadrant shaped nor ending abruptly at the middle line. There is no reason why a vascular condition might not just as well occur in the tract itself or in the external

geniculate body. Dr. Williamson has noted neither an increase nor a betterment in this condition, therefore the assumption that it is vascular in origin is probably correct. He has failed to get Wernicke's pupillary reaction. If he could get it, it would be practically confirmatory of the view that the lesion is either in the tract or in the external geniculate body. In lesions of the external geniculate body and in lesions of the optic tract, it is common to find optic atrophy, but anything beyond that does not bring about an optic atrophy. He agrees with Dr. Williamson that he has reason to assume a vascular lesion, but he believes that in all probability it is either in the tract itself or in the external geniculate body.

Dr. Williamson stated that his experience with this defect was limited to this case. In the literature he had noted that symmetrical partial defects had been more frequently ascribed to lesions of the cortical center than to lesions of the tract. If the crossed and uncrossed bundles lie separate, how could one hemorrhage produce double destruction of the bundle of fibres?

Ossification of the Eyeball (Specimens).

By Dr. A. Alt. Microscopical sections of the eye presented at the previous meeting were shown. This eye is a pathological museum in itself. There is bone formation with marrow, of very large extent, inside the choroid and ciliary body. The lens is calcareous. In the cornea there are deposits of what for want of a better name we call colloid. The anterior chamber forms a cyst lined with endothelium throughout.

DISCUSSION: Dr. Williamson asked Dr. Alt whether he could determine where the bone was springing from? Was it true, as Knapp believed, that the bone always sprung from choroidal tissue?

Dr. Alt stated that the bone was growing around the blood vessels. There were two ways of bone formation, one where the bony tissue seemed to appear as connective tissue, and the other where the lime lies free in the tissue, and gradually ossifies, as exemplified where bone joins cartilage in other parts of the body.

JOHN GREEN, JR.,

Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of February 15, 1908, in Denver.

DR. DAVID B. STRICKLER, Presiding.

Secondary Glaucoma.

Dr. David H. Coover presented a man, aged fifty, who consulted him on the second of last January, stating that about a month previous he had first noticed blindness of the right eye. A few weeks before this he had no difficulty in sighting accurately with this eye, in shooting.

At the time of discovering the blindness the family physician treated this patient for "pink eye." A thick pterygium lent color to this diagnosis. Dr. Coover found the iris discolored, pupil bound down, ciliary injection, normal tension, vision = light perception, fundus details invisible on account of cloudy media. Pain in and around the eye at night only. Atropin and "mixed treatment" were ordered. Returning home, the pain increased, attacks coming on every three or four days. Pilocarpin and large doses of sodium salicylate gave no relief.

He returned to Dr. Coover, February 4, with tension plus one, the upper half of the pupil dilated, the lower half adherent, vision = light perception, cornea steamy and anesthetic, and with two new-formed, tortuous blood vessels visible on the iris. Severe pain was relieved by hot applications, but increased by either eserine or pilocarpin. The tension varied day by day from normal to plus, and occasionally tremulousness of the non-adherent portion of the iris and bulging of the nasal portion was observed. Transillumination failed in the region of the pterygium. Dr. Coover asked for suggestions as to diagnosis and treatment.

DISCUSSION: Dr. Stevens had seen this case in consultation with Dr. Coover, and considered the condition very obscure; but was inclined to believe in the presence of a tumor at the base of the iris or anterior part of the ciliary body, or glaucoma secondary to intro-ocular hemorrhage. He also noted marked arteriosclerosis.

Dr. Jackson was divided in opinion between a neoplasm and vascular disease, with possibly hemorrhage in the ciliary region. The blood vessels and tissues of the iris were rigid, as shown by the pupil not contracting after withdrawal of the mydriatic used.

Drs. Davis and Libby thought the new-formed vessels suggested a new growth. Dr. Bane would apply adrenalin to the

pterygium, and then try transillumination again. In general he would enucleate such an eye. Others present believed this to be the best procedure in the case. Drs. Walker and Neeper would perform iridectomy. To this Dr. Coover urged the probability of severe bleeding.

Drs. Ringle and Patterson considered a new growth probable, the latter believing it to be malignant.

NOTE.—Dr. Coover subsequently reported enucleation of this eye. Macroscopic examination by Dr. F. A. Lane, Chicago, revealed epibulbar tumefaction of inner limbus corneae; iritis plastica, with almost complete pupillary synechia; cataracta aceta; no evidence whatever of intra-ocular growth; excavation of optic disc; extensive hemorrhagic retinitis; a few vitreous opacities.

Atypical Cataract.

A woman of about fifty, who caned chairs, was also shown by Dr. Coover. Her right eye had been operated for cataract twelve years before; the iris having so caught in the corneal incision as to displace the pupil upwards as far as possible. A dense membrane covering this pupil showed a minute central opening through which vision = fingers. The left eye showed a very thin cataract, through the center of which a faint fundus reflex was observable. Vision = perception and projection of light. The pupil dilated well except for slight synechia below.

DISCUSSION: (Left eye) Dr. Jackson believed there was tough, hard lens matter to depth of 1 to 2 mm. Some of this cortex he would extract; being afraid that free needling would give a dangerous reaction. He regarded radiations on opaque material as indicative of lens cortex.

Dr. Davis thought the absence of tremulousness of the iris indicated the presence of lens cortex.

Dr. Hess would do iridectomy, and extract the lens and tough capsule. Dr. Sissin suggested needling; while Drs. Bane and Libby would extract in capsule.

Dr. Ringle advised a preliminary needling. If there was no undue reaction he would also needle later, using two needles.

Dr. Walker considered simple extraction to be the operation of choice. Dr. Coover said, in closing, that he should advise iridectomy, extraction of cortex, and cutting of capsule with the DeWecker scissors.

Pemphigus.

Dr. W. C. Bane showed the case of entropion presented by him at the January meeting. He had since evacuated a drop of pus from the chalazion.

DISCUSSION: Members who had seen this patient previously believed there had been an increase in the contraction of the conjunctiva of the lower cul-de-sac.

Drs. Jackson and Walker concurred in the diagnosis of pemphigus; and had seen the blebs of this disease, in the nose, when absent from the eye.

Dr. Neepor advised the use of dionin.

Cases Reported.**Myotics.**

Dr. E. R. Conant had recently seen headaches that came on at night, or were worse then, helped by nightly instillation of 1 $\frac{1}{2}$ per cent eserine salicylate for a few weeks, in several cases between 34 and 50 years of age.

Dr. Stevens spoke of the good effect of eserine while first getting accustomed to glasses that are not well borne.

Dr. Jackson mentioned Dr. John Green's practice of using at night one-fifth to two-fifths per cent pilocarpine for asthenopia not relieved by glasses.

Dr. Coover reported typical acute glaucoma in a man of 65 following the use of two-fifths per cent atropine by the family practitioner in a case of probable chronic glaucoma. Prompt double iridectomy gave relief.

Trachoma.

Dr. W. A. Sedwick had recently observed improvement of vision in a case of trachoma, from counting fingers to 20/30 partly, from energetic scouring of the lid with boric acid crystals. He also used 20 per cent argyrol applications.

Dr. Coover had lately found sterilized sand paper effective in the papillary form of trachoma. It produced a smoother surface than gauze and boric acid, with less reaction.

Acute Conjunctivitis.

Dr. Bane stated that boric acid powder placed in the conjunctival sacs would cut short acute conjunctivitis.

Dr. Ringle had found one application of adrenalin and cocaine, followed by one of 10 to 20 per cent argyrol, aborted acute conjunctivitis, frequently.

Ocular Effects of Erysipelas.

Dr. Coover reported facial and ocular infection from erysipelas in the nostril of the same side, in an adult. The conjunctiva of the lower lid was a dirty gray, both lids were swollen, and there was a mucopurulent discharge. Convalescence occurred after three weeks. He also reported a woman, aged 72, suffering from erysipelas, in whom the affected eye burst and shrunk; and a man whose eye was destroyed by erysipelas from an infected wound above that organ. He had noted the *trivial* pain, contrary to panophthalmitis generally.

Dr. Strickler reported loss of vision and hearing power in a few days after erysipelas developed, in a man of sixty. Death occurred in one week.

Dr. Stevens mentioned a case of blindness, without pain, following erysipelas.

Dr. Jackson spoke of a case of nonseptic thrombosis of the cavernous sinus, which crossed from the right side of the nose to behind the left eye, causing proptosis.

Scarlet Fever Keratitis.

Dr. Bane had recently observed mild binocular inflammation in this disease in a child of two months, one day; followed the next by rapid softening and destruction of the cornea of one eye. Streptococci were found in the nose and the eye.

Influenzal Panophthalmitis.

Dr. Jackson reported panophthalmitis following influenza. Tension plus 2, and rapidly increasing exophthalmos. In two or three days pus appeared in the anterior chamber. The cornea burst. The pus showed the bacillus of influenza. Later the patient died of pericarditis.

Mooren's Ulcer of the Cornea.

Dr. E. W. Stevens reported a case of Mooren's ulcer. The patient, a woman aged 72 years, came under observation July 10, 1907, with the following history: On July 1 her right eye became primarily inflamed. She had treated the eye herself with borie wash and had worn colored glasses. On examination a non-purulent, clear, shallow ulcer was seen near the upper corneal margin of the right eye. The ulcer was crescentic in shape, with one edge undermined so as to form a flap two mm. wide; under the flap was a line of infiltration of a dull white color. A small

part of the ulcer behind the cleft edge stained with fluorescein. The ulcer was anesthetic. Applications of tincture of iodine, carbolic acid and nitric acid during the ensuing weeks were made without the use of cocain, and produced little or no discomfort. There was very little redness of the eyeball at the first examination. Later a well defined pericorneal zone and vascularization of the base of the ulcer developed.

The corneal epithelium surrounding the ulcer, excepting that portion covering the overhanging flap, was loosely adherent and could be easily pushed aside with a cotton covered probe. It quickly reformed. There was no hypopyon nor iritis. The treatment adopted was clipping away the overhanging edge of the ulcer with scissors and curetting with a spud the thin layer of infiltrated tissue. The whole surface was then touched with tincture of iodine. Atropin was instilled and a bandage applied. The patient was directed to bathe the eye with hot water for twenty minutes three times daily, and a boric wash was ordered.

For the next two months the ulcer was treated at regular intervals, being curetted and cauterized many times with various agents, as carbolic acid, tincture of iodine, etc. At times the disease seemed to be under control, but it proved to be only short intervals of rest, to be followed by a further advance, beginning in the line where the undermined edge had been destroyed. Dr. E. Jackson saw the case in consultation when the ulcer had been under treatment for eight weeks, and at his suggestion nitric acid was applied.

During the following month the ulcer was cauterized at intervals with this agent. The patient was discharged after having been under treatment for fourteen weeks. The upper half of the cornea was leucomatous; but this condition greatly improved during the following four months:

The diagnosis of Mooren's ulcer will always be clouded by doubt during the early stages, or when the ulcer heals with a few weeks' treatment.

The diagnosis seems justifiable in this case for the following reasons:

(1) It was a chronic non-purulent ulcer belonging to the marginal group.

(2) It presented the peculiar undermined advancing edge forming a narrow, sinuous, whitish band level with the cornea beyond, described by Nettleship. t

(3) The anesthesia of the cornea behind the advancing margin of the ulcer.

(4) The absence of purulent infiltration.

(5) Its chronicity and intractable nature.

Dr. Edward Jackson reported the following case of Mooren's ulcer: A man, aged 64, carpenter, and otherwise healthy, came for inflammation of the left eye. Two years before he had a similar attack in the right eye, lasting several weeks, and leaving a small macula in the upper third of the cornea. This eye now had vision of $\frac{1}{6}$ with lens. The attack in the left eye had begun eight weeks previously; the lower two-thirds of the cornea was involved, the opacity covering the undilated pupil. At the temporal side it was vascular, and along the limbus to the nasal side an area of nearly one-fourth of the cornea stained with fluorescein. The ulceration was superficial, and to the lower and nasal sides overlapped by a thin layer of tissue, chiefly epithelium and vessels, which showed no tendency to adhere to the ulcer. The edges of the ulcer were cauterized with nitric acid. This caused pain lasting six or eight hours; but next day the eye was more comfortable than before the application. It improved for two days, then became painful, and the whole surface was cauterized with nitric acid. In eighteen days the acid was applied five times. After each application there was a marked narrowing of the ulcer, and three days after the last application the ulcer had healed.

Vision had fallen to counting fingers at four feet; but three weeks after the healing of the ulcer, had risen to $\frac{4}{25}$ with pupil undilated.

GEORGE F. LIBBY, Secretary.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

*An Ordinary Meeting of the Society Was Held on Thursday,
January 30, 1908.*

MR. R. MARCUS GUNN, President, in the Chair.

The following card specimens were shown:

Mr. E. E. Henderson: Sections from case of Sarcoma developing under Calcareous Plate.

Mr. P. C. Bardsley: A New Form of Scotometer.

Mr. S. Stephenson: A Case of Buphthalmia apparently cured by the performance of iridectomy.

Dr. L. Guthrie and Mr. S. Mayou: Right Hemiplegia with Obstruction (thrombosis) of the Left Common Carotid and Central Artery of the Retina, with Perception of Light in the Eye.

Mr. G. H. Goldsmith: Optic Neuritis.

Mr. J. S. Horsford: Essential Shrinking of the Conjunctiva.

Mr. C. Wray: Sympathetic Iridocyclitis.

Papers.

Mr. S. Mayou: Microphthalmia, resembling Glioma, with Lenticonus and Hypertrophy of the Ciliary Body.

Mr. Mayou said the case belonged to the class of phthisis bulbi. Some of these cases had been of inflammatory origin, but this, and possibly some of the other cases, were attributable to the imperfect development of the mesoblast, and it entering the ocular cleft to form the vitreous. The child was six months old, and was admitted under Dr. Hancock. The mother had noticed that the left eye was very small from birth, but the child had no other deformities. There were no signs or history pointing to congenital syphilis. The right eye was normal in size, and there was nothing abnormal in the fundus. In the other eye there was a well marked pupillary membrane. Behind the lens, which was clear, was a yellowish-white reflex, with vessels on it, similar to that seen in glioma and pseudo-glioma. As diagnosis was doubtful, enucleation was performed, and the child made a good recovery. The eye was hardened in formol, and sections cut antero-posteriorly. The optic nerve was removed, and cut in transverse section. The globe measured 15 mm. antero-posteriorly, 10 vertically, and 10 horizontally. The sclera showed no change. The angles of the anterior chamber were imperfectly formed, owing to incomplete separation of the iris from the back of the cornea. The ciliary body was free from signs of inflammation. Behind, and lying on the pars plana was a large mass of pigmented and unpigmented cells, derived from the ciliary body. Towards the outer part was an attempt at alveolar formation. The retina was detached, but did not stop at the *area serrata*, but passed close behind the ciliary process, where it was continuous with the anterior layers of the epithelial cells and the mass mentioned. The lens was thickened and thrown into folds, and consisted principally of neuroglial tissue, but possessed no regular structure. The retinal detachment was of earlier date than the hemorrhage. The choroid presented a coloboma below, but the

blood vessels were not thickened. The lens showed a condition of posterior lenticonus. The central artery was well developed and showed no changes in its walls. Generally in such cases the distortion of the posterior part of the lens was associated with a persistent hyaloid artery, or a gap in the posterior part of the lens capsule, but neither of those conditions was present in this case. There was a hypertrophy of pigmented and non-pigmented epithelial cells, the reason of which it was difficult to understand, unless it was due to nutritional disturbance in the line of separation of the two layers in the primary optic vesicle.

Mr. L. Paton read a paper on "Optic Neuritis in Cerebral Tumors." The paper was based on the records of 252 consecutive cases seen at the National Hospital, Queen Square. In 202 of those, the localization of the intracranial tumor was definite, and 148 were confirmed by operation or *post mortem*. Of the 202 cases, 38, or 18 per cent, had no neuritis, 12 had only very slight neuritis, the edges being at no period completely blurred, 27 were in a condition of post-neuritic atrophy when first seen, and the remaining 125 had marked neuritis. Mr. Paton pointed out that the great majority of cases without neuritis occurred in subcortical and pontine tumors. The percentage of cases with no neuritis in tumors of those two areas was, respectively, 38 per cent and 43.5 per cent. He pointed out, further, that when sub-cortical tumors developed optic neuritis, it almost invariably indicated that the growth had involved either the gray matter of the cortex or the gray matter of the base, and that when pontine tumors developed optic neuritis it practically, without exception, indicated very definite involvement of the cerebellum. He showed that in tumors of the cerebral cortex the intensity of the neuritis seemed to vary inversely with the distance of the tumor from the anterior pole of the middle fossa. He adduced evidence to show that the nature of the growth had little if any influence on the development of optic neuritis, except in so far as the nature of the growth might influence its position. He stated that the figures showed that very little reliance could be placed on differences in the intensity of the neuritis as indicating the side of the tumor, and that in the case of frontal and of cerebellar tumor, neuritis was just as frequently most marked in the optic disc of the opposite eye as it was in the eye on the side of the tumor. The neuritis commenced more frequently in the eye on the side of the tumor than in the opposite eye, but even here the preponderance—23 to 43—was not sufficiently marked to make the sign one

of much value for localizing purposes. He described in detail the development of the macular changes seen in intense cases of tumor neuritis, and showed that these changes were most probably produced by an overflow of cedematous fluid from the much swollen disc into the nerve fibre layer, and that the presence of very well marked macular fans was compatible with the retention of perfectly good vision. The causation of the temporary attacks of blindness, lasting from a few seconds to half an hour, was discussed, and it was shown that these were probably not associated with optic neuritis, as they had been observed three times in cases where no optic neuritis developed, and in other cases these fleeting amblyopias had occurred before ophthalmoscopic evidences of disc change were present. It was suggested that these attacks were due to sudden rises in intraventricular tension, causing a bulging of the thin floor of the third ventricle, and to direct pressure on the chiasma. The attacks were invariably accompanied by increased headache and giddiness. He pointed out that there was no evidence in favor of optic neuritis in these cases being due to an inflammation descending from the basal meninges, nor was there evidence in favor of its being due to pressure of fluid in the vaginal space. The clinical evidence against it being a descending inflammation in the nerve trunks was even stronger, nor was there any more evidence in favor of the neuritis being produced locally by the action of toxins, or of its being a vaso-motor phenomenon. He regarded our knowledge as yet insufficient to justify any definite theory as to the causation of optic neuritis, but a general review of the subject in its clinical aspects inclined him to the view that in so-called optic neuritis there was simply a manifestation locally of a general cedema of the cerebral tissues, due to the irritation set up by the tumor as an actively growing foreign body.

The following two papers by Mr. Simeon Snell were, in his absence, taken as read:

Carcinoma of Orbit Originating in a Meibomian Gland.

The case occurred in a woman aet. 63. In 1904 another surgeon had removed a lump from the right upper eyelid. In July, 1905, there had been a recurrence at the site of that scar reaching back to the orbit, and about the size of a walnut. This was removed with the portion of eyelid, but in June, 1906, there was another recurrence, and then the eyeball was removed and the whole orbit cleared out, and chloride of zinc paste applied. Still further recurrence had occurred, and the orbit was filled

with a large ulcerated growth and the preauricular and cervical glands were enlarged. Dr. A. E. Barnes reported that it was a spheroidal celled carcinoma, and was of opinion that it had probably originated in a Meibomian gland. Mr. Treacher Collins corroborated this.

The second paper was on Coloboma of Iris in Each Eye, occurring in five generations. Mr. H. was the first person seen, and he had a large coloboma in each eye, down and out. The defect was known to have existed in his grandmother, in her sister and in his mother. Mr. H. had six children, three of whom were affected, and of these, two had children—one three children, of which two were affected, and one child affected. Mr. H. was the only child of his father, but his mother had, by a second husband, five children, of which three were affected. One of these had three children, two of whom were affected. The other had one child, which was not affected. In all, of forty-one persons, twelve were affected—five males, seven females. In the great-great-grandchildren the defect was complete aniridia.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting January 16, 1908.

Dr. HOWARD F. HANSELL, Chairman, Presiding.

Dr. G. Oram Ring exhibited a patient showing extensive splotches of *Xanthelasma* on each upper and lower eyelid. Typical chamois colored areas of degeneration were noted, 11 by 6 mm., symmetrically situated at the inner angle of each upper lid. Similarly colored patches were present on each lower lid about 21 by 6 mm. A small spot was present at the outer canthus of each eye, and between this spot and the main growth on the right lower lid was a bridge 3 by 2 mm. The patient was thirty-two years, old, married, no children, no history of miscarriage. She had suffered severely for years at her menstrual periods, and had a double ovariectomy performed three years ago. Her mother had similar splotches, but smaller, and died of some liver disease complicating the menopause.

With a view to establishing a connection between the local manifestation and the systemic condition, Dr. David Edsall was asked to study the case, and his analysis will be published in a

future report when treatment is completed. Specific gravity of the urine was 1040, and elimination was very defective. As diabetes was absent, the well-recognized Xanthoma diabeticorum could be excluded. Tuberculosis and syphilis could also be excluded, the former disease presenting a rare variety of xanthelasma. The macules are usually situated near the inner canthus of the upper lids. The condition is one of the forms of fatty degeneration, cholesterol crystals and the so-called xanthoma bodies usually being present.

The treatment must be systematically eliminative, locally, the x-ray or electrolysis. The removal of the growths by operation is usually followed by recurrence.

Dr. Edsall said the examinations of the general conditions present were not yet complete, but so far had shown no definite form of constitutional disturbance. The patient gave an indefinite history of a disorder of nutrition; she had suffered with epileptiform attacks, which had given way to periods of nausea and headache. Her physical condition showed no definite abnormalities. The urine showed no evidence of diabetes, but was small in amount and had a high specific gravity, indicating poor elimination. This is common among women, and is usually due to the fact that they drink too little water. Examination for intestinal decomposition products showed only an excess of indican. Further study would be made and the results reported later.

Dr. Walter L. Pyle spoke of a case under his care about two years ago very similar in appearance to that of Dr. Ring, in which several treatments with electrolysis effected a cure without any subsequent recurrence. The patient was a vigorous Irishman of about forty-five years, who had always enjoyed perfect health. Dr. Pyle believed that, as so many of these cases were seen in robust adults, the efforts of internal clinicians to establish a relation with pronounced metabolic disturbances were not likely to be followed by significant results.

Dr. G. E. de Schweinitz said that he thought it was not infrequent to find, especially in women, as Jonathan Hutchinson had pointed out, very extensive bilateral involvement of both lids. In his own practice the most extensive case had occurred in a man aged forty-two, the patches of xanthelasma being so closely placed together on the four lids that it was difficult to see any true skin between them. They had been removed on two different occasions by other surgeons, always with recurrence, and it was Dr.

de Schweinitz's opinion that removal of this lesion was not a wise procedure. In recent years he had always caused the xanthelasma patches to be treated either with electrolysis, which had sometimes succeeded and sometimes failed, or, if they were small, with applications of trichloroacetic acid, which had in some instances given great satisfaction. He thought it was extremely interesting to make a general examination of these patients, as Drs. Ring and Edsall had done of the one under consideration, but it had been his experience that there was no constitutional condition especially related to the development of this disease of the skin, as many of the patients were in the most robust health. The most extensive case recorded in literature with which he was acquainted was the one described by Morax, in which the xanthelasma patches, in addition to involving most extensively both upper lids, were placed also upon the cheeks, the side of the nose, and the skin behind the ear.

Dr. Ring said he intended to exhaust the possibilities of x-ray treatment before trying any other method, as good results have been reported without recurrence for a period of two years. *Removal of a Foreign Body from the Iris.*

Dr. Ring also showed the result of *Removal of a Foreign Body from the Iris* in the patient whom he had presented at the previous meeting of the Section. The operation had been performed one month after the accident.

After etherization the Sweet magnet was applied to the cornea and drew the portion of the iris in which the foreign body was lodged toward the cornea, but failed to dislodge it. A small corneal section was then made and the magnet applied to the lips of the incision. The foreign body failed to leave its exudative bed until a small area of iris presented itself through the wound. A very small iris section was made and atropine instilled. The healing process was prompt and uneventful, and normal vision was finally secured.

Dr. Hansell said he had recently seen one of the most remarkable cases of localization of a foreign body in his experience. The lens was opaque, and Dr. Sweet had located the object at its posterior pole. On application of the magnet to the front of the eye, the body was drawn through the lens until it rested upon the anterior capsule. A cataract incision was then made, the tip of the magnet inserted, and the body secured, and after iridectomy the lens was extracted. Healing was prompt and the patient left the hospital at the end of four days.

Acquired Cataract in Childhood.

Dr. Howard F. Hansell reported the *Subsequent History of a Case of Acquired Cataract in Childhood*. The lens of the left eye became completely opaque and was removed by three discissions. The thickened capsule with adherent lens matter was extracted. Vision was restored for three weeks, and was then lost through degeneration of the vitreous and detachment of the retina. Fearful of the same result, should the same operation be performed on the right eye, the method of linear extraction was adopted. Instead of the usual capsulotomy, the anterior capsule, which had become opaque simultaneously with the lens, was extracted with forceps before expression of the lens. Healing was prompt and uninterrupted, and at the last examination the patient had excellent vision with cataract lenses. In the early stage of the cataract in the right eye central choroiditis was detected and treated by the mercurial inunctions for several months. After operation no trace of the choroiditis could be seen. In the absence of all other causes he thought the inflammation of the choroid might be properly regarded as the cause of the cataract. The early report of this case, with references to the literature was published in the *Trans. Amer. Oph. Soc.*, 1901.

Two Cases of Obstetric Injury of the Cornea.

Dr. de Schweinitz related the clinical history of two cases of *Obstetric Injury of the Cornea*, one examined immediately after birth, and the other as a late result in an adult. In the first patient, a male baby, after a difficult forceps delivery, there was found a misshaped cornea which had assumed the appearance of a keratoglobus, with a deep anterior chamber and a diffuse haze of the cornea, thicker in the center, and which occupied this tissue entirely, with the exception of a narrow rim above and below. At first the epithelium was unaffected, but later became slightly macerated. No striæ could be seen through the dense haze, and therefore no positive evidence of rupture of Descemet's membrane was obtained. The condition was evidently due to an edema of the corneal tissue, and belonged to the first of the classes established by the investigations of Thomson and Buchanan. The baby died on the eighth day. Autopsy was forbidden.

In the second case there was a delicate, slightly dotted linear opacity, 6 mm. in length and 1½ mm. in width, in the posterior layers of the cornea, extending in a vertical direction. In other

respects the eye was normal, and the vision, after the correction of a high astigmatism, reached 6/7.5. At the patient's birth instruments had been used, and in addition to the lesion of the cornea there was a scar, also caused by the forceps, 2 cm. above the brow.

Dr. de Schweinitz briefly reviewed the literature of the subject, making special reference to the capital papers of Thomson and Buchanan and a comprehensive review of the entire subject by Bruno Wolff, and thought that more careful investigation of patients who came with high corneal astigmatism, especially if confined to one eye, might reveal this early lesion of the cornea as the etiological factor.

Dr. Posey said he had seen Dr. de Schweinitz's first case, but at that time the keratoglobus had practically disappeared. He thought that the ocular muscles were often involved in these obstetrical injuries, and that many cases of congenital palsies, on careful questioning, could be traced to the use of forceps or to an unusually difficult labor.

Dr. Walter L. Pyle remarked that although almost every form of ocular injury had been reported as proceeding from forceps delivery, yet the evil results were very small in comparison with the enormous number of cases in which this instrument was applied. It was fair to assume that in the vast majority of cases, if forceps were used with ordinary care and skill, permanent ocular injury was not likely to follow. In preparation of an editorial on this subject several years ago he had occasion to review the literature of ocular traumatism during labor.

Since then the subject had been very exhaustively treated by Thomson and Buchanan and Peters and Wolff. The chief injuries (usually from pressure of the blades of the forceps) reported were excoriations, edema, fracture of the orbit, corneal affections, hyphemia, paralysis of the ocular and eyelid muscles, retinal and retrobulbar hemorrhages, optic atrophy, cataract, dislocation of the lens, exophthalmus, and avulsion of the eyeball. Of course, it was in cases of contracted pelvis that most of the injuries occurred, but even in the course of natural labor, traumatism of the eyelids with the resultant edema and ecchymosis and conjunctival hemorrhage and chemosis were often seen. According to Thomson and Buchanan, there sometimes occurred in normal or unassisted labors retinal and choroidal hemorrhages. One of the most striking and curious cases of ocular injury during labor noted in ophthalmic literature was that reported by de

Wecker of a face presentation in which an orbit was mistaken for an anus in breech presentation and the eyeball gouged out by the obstetrician's finger.

Dr. Zentmayer said that Peters had reported cases of congenital dacryocystitis due to stenosis of the duct as a result of injuries to the bone by forceps during delivery.

Dr. Harlan recalled a report that he had seen several years ago, in a foreign journal, of a number of cases in which minute hemorrhages at the macula were attributed to injury during labor. The author claimed that many cases of congenital amblyopia might be explained by this lesion.

Dr. S. D. Risley had seen one case, an adult with a deep scar on the right brow caused by instrument delivery. The forceps blade evidently had been applied with crushing force, displacing downward the upper wall and rim of the orbit. The left eye was nearly or quite emmetropic, but the right eye had a high grade of mixed astigmatism, which he had ascribed to the misshapen orbit.

Dr. Randall said it was more germane to Dr. Pyle's remarks than to Dr. de Schweinitz's paper to remind the Fellows that in examinations of the eyes of infants, those who made the measurements in the first day or two of life, like Schleich, found retinal hemorrhages quite constantly and the nerve head often swollen 3 to 5 D. higher than could be measured even in the same eyes a week or more later. Such findings were especially common after difficult or instrumental labors. In the prepared eyes of the newborn he had observed the same edematous swelling, as in a specimen of the late Dr. Norris, which he had put on record (*Trans. Am. Oph. Soc.*, 1888) because of its exquisite demonstration of an aberrant cilioretinal artery. The few cases of infantile myopia were probably to be ascribed to a forward subluxation of the lens, such as he had observed from trauma later in life as a temporary finding, since large series of anatomical studies such as v. Jaeger's of seventy eyes of newborn had shown no instance of axial myopia.

Dr. de Schweinitz, in closing the discussion, said that his paper had referred only to the corneal lesions of obstetric injuries, although the others which had been described were full of interest. Anyone who desired to pursue this subject would find the most elaborate record of them in Bruno Wolff's comprehensive review of this entire topic. The distortion of the cornea in his first patient, so that it had assumed the appearance of a kerato-

globus, lasted only about a day, and in this respect it had followed a course presented by other similar cases. He agreed with Dr. Pyle that it was remarkable that comparatively few of these corneal injuries had been reported when one remembers the great number of instrumental deliveries, but thought that they were probably not as uncommon as they appeared to be, because since they had been thoroughly studied by Buchanan and Thomson more and more of them were appearing in literature, and doubtless many of the cases of slight linear scars which were evident in the corneas and found during the course of routine investigation, for which no adequate explanation was at hand, might be found to have an origin in a birth injury, provided the history of the patient was thoroughly investigated.

Microphthalmus, Extensive Colobomata, and Other Congenital Defects.

Dr. Walter L. Pyle reported a *Case of Microphthalmus, with Extensive Colobomata, and other Congenital Defects in both Eyes* in a young man, twenty-five years old. The family history showed no striking ocular affection or abnormality, and the patient's health had always been fairly good. In addition to the ocular conditions he presented extreme congenital torticollis, the head being bent to the left. The mental development was below normal, the countenance being dull and apathetic, but despite poor vision he was able to drive about the country without difficulty, and could read the daily newspaper if the illumination was good. Both eyes were affected with nystagmus of varying degrees.

The right eye was extremely small, the corneal diameter measuring but 8 mm. There was partial coloboma of the iris. The pupil was vertically oval and displaced downward. Fetal remnants were seen in the lower median portion of the pupillary openings. The movements of the eyeball were irregular and greatly limited in the upward rotation and almost lost in external rotation beyond the median line. Ophthalmoscopic examination showed extensive affection of the choroid and retina, with pigimentary changes throughout the whole fundus. There was a medium-sized inferior coloboma of the choroid and optic-nerve sheath. Vision equals 20/80, not improved by lenses.

The left eye was considerably larger, the diameter of the cornea measuring 10 mm. There was complete coloboma of iris downward in the median line, giving the appearance of the so-called "keyhole" pupil. Fetal remnants were plainly visible in the inferior periphery of the coloboma. Ophthalmoscopic exami-

nation showed an extensive inferior coloboma of the choroid and optic-nerve sheath, simulating an enormous posterior staphyloma. The refraction was highly myopic, some portions of irregular fundus-plane measuring as much as 20 D. Vision equalled 4/200, and could not be improved with concave lenses beyond 10/200. The ocular movements were irregular and much restricted, and the power of external rotation beyond the median line was practically lost. Both pupils were responsive to light-stimulus and dilated slightly under homatropine and cocaine.

The interesting feature of the case was the remarkable preservation of useful vision in a microphthalmic eye, with a corneal diameter of only 8 mm. Dr. Pyle discussed the theories offered to explain the causation of these abnormalities, and thought they were due to interference with complete closure of the fetal ocular cleft, either as the result of abnormal persistence of the mesodermic tissue or to fetal inflammation in the region of the cleft. According to Lang and Collins, the defect in the choroid was due to an abnormal adhesion of the retina to the mesoblast. When this occurred before the retinal fissure closed, the coloboma was devoid of retinal elements; but when it occurred later the retina was present and there was no scotoma corresponding to the colobomatous area.

Dr. Harlan said that Wild, in his book on deformities of the eye, stated that entire absence of the ball is rare, and that even when only the smallest rudiment of an eye is present the external muscles exist. He met with a curious illustration of this some years ago in the case of an inmate of the Institution for the Blind in which a minute nodule, half the size of a pea, was in constant and lively nystagmic motion.

Binocular Exophthalmus.

Dr. Risley presented for inspection the case of *Binocular Exophthalmus* which he had shown to the Section at the preceding meeting. By a process of exclusion he had then made a diagnosis of a large gumma in the region of the cavernous sinuses, retarding the circulation through them. The woman had been placed in bed, and mercurial inunctions, with ascending doses of iodide of potassium, administered. The headache had ceased within a week, the exophthalmus had disappeared entirely, the motility of both eyeballs was restored, and the visual acuity had risen from 1/5 to 6/6 in the right eye and 6/9 in the left. Dr. Risley expressed the conviction that the result of the treatment had confirmed the diagnosis made the month before.

A Case of Toxic Amblyopia Presenting Some Unusual Features.

Dr. John T. Carpenter showed a patient with partial optic atrophy, with absolute central scotoma extending from fixation point about 20 degrees in all directions, while the peripheral field was normal for white, but no colors were recognized in this area. The patient, a man of thirty-five years of age, presented the usual ophthalmoscopic appearance of complete gray atrophy without vascular changes in the retinal system. An unusual feature was the persistent and annoying subjective visual disturbance in the blind area of the field, occurring as flashes and scintillating color phenomena of red color, present at all times, but most annoying at night when lying in bed. The interesting features were: (1) The persistence of an absolute, sharply defined, central scotoma remaining unchanged for one year, with full peripheral form field and achromatopsia. (2) The diagnostic interest lay in the differential diagnosis between toxic amblyopia from alcohol, tobacco, and lead (type-setting being his occupation): chiasmal disease with central scotoma; syphilitic atrophy; and possible central nervous disease, as tabes or disseminated sclerosis, with this unusual type of optic atrophy as the earliest symptom. X-ray pictures showed no sinus disease. (3) The futility of treatment so far as restoration of vision was concerned, mercury, enormous doses of iodides, strychnine, and nitroglycerin having been faithfully tried without result. (4) The entire absence of any symptoms of central nervous disease after careful examination of the patient by Drs. Charles K. Mills and Wm. G. Spiller.

Dr. Carpenter believed the case to be one of chronic retrobulbar neuritis from the combined action of alcohol, tobacco, and lead in a man the subject of nervous exhaustion caused by anxiety and overwork.

Dr. de Schweinitz said that he had had the opportunity of examining Dr. Carpenter's patient on several occasions, finding the conditions which have already been described. At first he thought that the optic-nerve degeneration could best be explained by assuming that it represented the optic-nerve of tabes dorsalis, but he understood that Dr. Spiller's and Dr. Mills' investigations had entirely excluded the probability of this disease, or of multiple sclerosis, which had naturally also been considered. He thought it was not impossible that the patient's ocular disabilities should be classified with those which have been called stationary optic-nerve atrophy with scotoma, and which has been particularly de-

scribed by Jensen. In these patients a scotoma develops similar to the one which occurs with toxic amblyopia, but is much more decided. There are marked diminution of central vision, depreciation of the color sense, and the ophthalmoscopic appearance of simple atrophy of the optic nerve. The process is stationary, and vision does not improve under treatment. The affection has been found exclusively in men before their thirty-fourth year. It is said to have an hereditary tendency, and was attributed to exhaustion, lack of sleep, and other circumstances of similar depressing nature. The peculiar chromatopsia of which this patient complained was a point in favor of toxic amblyopia, and had not infrequently been described in various forms of toxic optic-nerve atrophy, the whole subject having recently been elaborately reviewed, together with the presentation of cases, by Hilbert.

EDWARD A. SHUMWAY, M. D., Clerk.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. K. Scholtz has qualified as instructor in ophthalmology in Budapest.

Dr. Ellett O. Sisson of Denver has been elected a member of the Colorado Ophthalmological Society.

The South Baltimore Eye, Ear and Nose Hospital is to have a new hospital building at 1211 Light street, Baltimore, Md.

Dr. Howard F. Hansell has been elected president of the section of ophthalmology of the College of Physicians of Philadelphia with Dr. Edward Shumway as clerk.

At the annual meeting of the Eye and Ear section of the Los Angeles County Medical Association, held in January, Dr. H. Bert Ellis was elected chairman, and Dr. William H. Dudley, secretary and treasurer.

Dr. E. W. Stevens, Denver, was recently elected vice-president of the Medical Society of the City and County of Denver. Dr. W. C. Bane, the retiring president, was elected a delegate to the State Society to serve two years.

Two competent eye, ear, nose and throat specialists desiring positions as associates can find extremely attractive positions by inquiring at the office of the Ophthalmic Record, 1209-72 Madison street, Chicago. These positions are outside of the city of Chicago.

At the annual meeting of the Pueblo County Medical Society in January, permission was granted for the formation of a special section for eye, ear, nose and throat. All members must first become members of the County Society.

Dr. Frank Van Fleet, chairman of the committee on legislation in New York state, has issued a plea to the medical profession there to use all possible influence to defeat the various crank bills at present before the legislature, such as optometry bills and anti-vivisection bills.

Dr. William C. Bane, a charter member of the Colorado Ophthalmological Society, recently completed the term of his presidency of the Medical Society of the City and County of Denver. On retiring from office, Dr. Bane presented the society with the photographs of its presidents since its organization. The photographs were framed in groups of six.

The Indiana State Optical Society, which recently succeeded in getting an Indiana statute licensing opticians, is now taking steps to secure its enforcement. They have employed detectives to gather evidence against unlicensed opticians and peddlers. The State Board of Examination and Registration in Optometry claims that it has no funds to prosecute such cases.

Investigations made in the Philadelphia schools last year by Dr. Wessels, a medical inspector working under the Bureau of Health, showed that many children were retarded in school progress because of eye strain or other eye troubles which could have been easily corrected by glasses. A large number of these children, however, were too poor to pay for glasses, even of the cheapest make. Some of them were provided with glasses by the School Nurse, from a fund collected for that object by the Visiting Nurse Society. A long step in the direction of relieving many other children whose eyes are defective, has recently been taken by Dr. Joseph S. Neff, director of public health and charities, who obtained an appropriation of three hundred dollars from City Councils to purchase glasses. The prescriptions will be filled by a local optician, and the words "Bureau of Health" will be stamped in the frames of the glasses, for identification in case they should be lost or stolen. On Dr. Neff's urgent recommendation, Councils further created the position of school ophthalmolo-

gist, to which Dr. L. C. Wessels has been appointed. Dr. Neff also urged the creation of a department of school nurses and the appointment of a neurologist, to serve in connection with the medical inspectors in the examination of backward children who are mentally defective. This department of school nurses has been organized through appropriations made by Councils to the Board of Education. It was not possible, however, to secure the appointment of a neurologist for the current year. The expenditure of the amounts appropriated for the year 1908, and the administration of the various departments under Dr. Neff's direction, will not only help the school children of Philadelphia directly, but will serve to educate public opinion and show the necessity for a more generous appropriation for another year.—*The Psychological Clinic*.

THE DEVELOPMENT OF OPHTHALMOLOGY IN AMERICA, 1800 TO 1870.

On the urgent request of numerous colleagues, Dr. Alvin A. Hubbell, of Buffalo, N. Y., has republished in book form the address which he delivered before the section of ophthalmology of the American Medical Association, at Atlantic City, N. J., last June. In this republication, the author has revised and much enlarged the text, and has incorporated twenty-nine portraits of the pioneers in American ophthalmology, and eight cuts illustrating the old eye institutions and ophthalmologic subjects. This work occupies a new field, viz., a historical one, in American ophthalmology, and will undoubtedly receive the commendation of American ophthalmologists.

This is a volume of nearly 200 12mo. pages and bears the title: *The Development of Ophthalmology in America, 1800 to 1870: A Contribution to Ophthalmologic History and Biography*.

New Books

Archiv Für Optik. A monthly journal edited by Alexander Gleichen, and published in Leipzig by Von Veit & Company.

Text-Book of Otology for Physicians and Students. In 32 lectures. By Fr. Bezold, M. D., Professor of Otology at the University of Munich, and Fr. Siebenmann, M. D., Professor of Otology at the University of Basle. Translated by J. Holinger, M. D., Chicago. Published by T. H. Colgrove Co., Chicago, 1908. Price, \$3.50 net.

CHICAGO EYE CLINICS.

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THE OPHTHALMIC RECORD.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|---|---|--|--|---|
| 9 A.M. | Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Pol.) Geo. F. Suker (P.-G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Pol.) Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.-G.) | G. W. Mahoney (Pol.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wippert (E. E. N. T.) | | A. G. Wippert (E. E. N. T.) | A. G. Wippert (E. E. N. T.) | A. G. Wippert (E. E. N. T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E. E. N. T.) M. H. Lebesch (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Wilder (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (P.&S.) S. L. McCright (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) Wm. E. Gamble (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. A. Phillips (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Francis Lane (Rush) M. H. Lebesch (P.&S.) S. L. McCright (C.C.S.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Lebesch (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Wilder (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (P.&S.) S. L. McCright (C.C.S.) | E. V. L. Brown (Inf.) M. H. Lebesch (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Wilder (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (P.&S.) S. L. McCright (C.C.S.) | E. V. L. Brown (Inf.) M. H. Lebesch (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Wilder (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (P.&S.) S. L. McCright (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) W. A. Fisher (E. E. N. T.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) D. A. Payne (Ils. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tynen (N.W.U.) Francis Lane (Rush) M. H. Lebesch (P.&S.) S. L. McCright (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P.&S.) | H. H. Brown (Ils. Med.) | J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | Barton Hazeltine (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.-G.) |
| 4 P.M. | W. F. Coleman (P.-G.) | C. W. Hawley (P.-G.) | G. F. Suker (P.-G.) | C. W. Hawley (P.-G.) | W. F. Coleman (P.-G.) | Brown Pusey (County) |

*Special operative eye clinics.

ABBREVIATIONS:

| | | | |
|--|---|--|--|
| C. C. S.: Chicago Clinical School, 814 W. Harrison Street. | County: Cook County Hospital, W. Harrison and Monroe Streets. | Pol.: Chicago Policlinic and Hospital, 174 E. Chicago Avenue. | Rush: Rush Medical College, W. Harrison and Wood Streets. |
| E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | Ils. Med.: Illinois Medical College, 182 Washington Blvd. | P.-G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. | St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
| Inf.: Illinois Charitable Eye and Ear Infirmity, Peoria and Adams Streets. | Inf.: Illinois Charitable Eye and Ear Infirmity, Peoria and Adams Streets. | N. W. U.: Northwestern University, 2431 Dearborn Street. | |

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII

CHICAGO, MAY, 1908

NO. 5, NEW SERIES

METHOD OF ILLUMINATING TEST-TYPE CHARTS WITH ARTIFICIAL LIGHT.*

BY NELSON M. BLACK, M. D.,
MILWAUKEE, WIS.

(Illustrated.)

Solar light as diffused by an overcast sky gives ideal illumination. However, the variations produced by the weather, the time of day, the inaccessibility of daylight to rooms where vision testing is done, has of necessity enforced the adoption of artificial means to illuminate objects used for measuring visual acuity.

Professor Basquin¹ of Chicago has determined that the variation in light from the clear sky was 1,050 candles per square foot in August to 140 candles in December of the same year.

The days were divided into five classes. No. 1, stormy; No. 2, overcast; No. 3, more than half cloudy; No. 4, more than half clear; No. 5, clear. The mean monthly brightness of the sky at 12:30 (noon) for two years, expressed in candles per square foot, was: Class 1, 310; class 2, 960; class 3, 750; class 4, 590; class 5, 460. The strongest illumination was on overcast or cloudy days, there being better diffusion.

The mean of the monthly readings, without regards to class of sky, varied from 2,200 candles per square foot in June to 270 in December. The mean monthly readings, taken at 4:30 p. m., without regard to class of sky, varied from 520 candles per square foot in August to 5 in December.

It will be seen that this great variation makes daylight illumination impractical for the purpose of testing visual acuity. Some means of artificial illumination must take its place. Petroleum, illuminating gas, acetylene gas and electricity place at our disposal an unvarying constant means with which to accomplish this purpose.

Of these electricity is the most convenient, as practically every city of sufficient size to support an ophthalmic surgeon is lighted by electricity; petroleum and illuminating gas and acetylene

*Read before the American Academy of Ophthalmology and Otolaryngology, Louisville, Ky., September 27, 1907.

gas are equally efficient from the standpoint of candle power required, but are less satisfactory to manipulate.

As this paper refers only to methods of illumination, the amount of light necessary for proper illumination of test charts will not be referred to, except to state that it has been determined that with a white surface having a relatively high coefficient of reflection, with an illumination of 2 to 2½ foot candles, the eye is working so near its normal sensibility that the further increase of the illumination is of relatively small value.² The committee appointed by the Ophthalmic Section of the American Medical Association to determine upon a standard of illumination for test-type charts will submit a full report upon this subject at the Chicago meeting next year.

Artificial illumination may be used in two ways, either reflected or transmitted. There is considerable difference in opinion throughout the United States as to the efficiency of these two methods, and to obtain an expression of opinion from the leading ophthalmologists the following questions were sent out:

"With the use of artificial light for illuminating test-type charts, which do you consider the most efficient, reflected or transmitted light?

"Why?

"Which gives the least discomfort to the examined person's eyes, especially when testing under a cycloplegic?"

Sixty-two replies were received and were classified as follows:

Eighteen preferred reflected light.

Nine preferred transmitted light.

Five used daylight only.

Three found practically no difference.

Twenty-five had had no experience with transmitted light.

One had no opinion to offer.

One question was asked not answered.

The following replies contain some suggestion or reasons for the opinions expressed:

Dr. Alvin A. Hubbell: "I have never used transmitted light. Reflected light is adequate and agreeable, providing the card boards are not glazed and shiny."

Dr. A. D. McConachie: "I use reflected light. Never have used transmitted. However, can conceive that the transmitted might be better when confined to a small area, and single row of test type at a time."

Dr. Kaspar Pischel: "I have always used reflected light. It is nearer the actual conditions under which we see."

Dr. W. R. Parker: "Have never used transmitted light for illuminating test-type charts. Reflected light has been satisfactory, but I would think transmitted light might be more restful."

Dr. C. A. Thigpen: "I find that reflected light (artificial) is more trying to the eyes under a cycloplegic than the natural solar light."

Dr. Myles Standish: "Generally speaking, the intensity of illumination of test card should not be overpowering in comparison with that of surrounding objects."

Dr. Leartus Conner: "All depends upon the amount of light entering the eye; generally as used by me the reflected light is best. But other arrangements might reverse the order."

Dr. Samuel Theobald: "Reflected; we commonly 'see things' by reflected light, have had no experience with transmitted light."

Dr. Bert Ellis: "Reflected light onto white letters on a black background."

Dr. Edward Jackson: "Reflected light, because a greater variety of test cards can be employed and there is less radiation. White letters on a black ground give least discomfort to examined person's eyes."

Dr. John E. Weeks: "The irradiation incident to the use of transmitted light seems to be the chief trouble. This appears to be more marked (the annoyance) when the pupil is dilated than when the pupil is small."

Dr. Henry Dickson Burns: "Reflected. It more nearly simulates the normal conditions."

Dr. Geo. F. Suker: "Reflected light—and patient to sit in very dark room—card, dull finish—reflection limited, if possible, onto card alone."

Dr. Chas. H. Williams: "Reflected, because the intensity of the illumination can be controlled and measured more accurately, and because it is in more general use and the results can be better compared. I have the opal glass test-type, but have not used them enough in comparison with the paper to make a proper answer to this question. (No. 3) The yellow paper, however, seems to be more agreeable than the white."

Dr. F. M. Chisholm: "Reflected, softer light and for test purposes more like daylight, as uniform and less artificial than transmitted light types, owing to sharp contrasts from field of illumination and its surroundings in the latter."

Dr. J. H. Claiborne: "Reflected light. Have no other. Never heard any complaint, though have of course noticed lack of good definition owing to spherical aberration under A or H."

Dr. J. W. Chamberlain: "Reflected, gives perfect illumination and is easily managed."

Dr. Frank C. Todd: "Reflected, light is more even and easier on the eyes."

Dr. D. T. Vail: "Reflected, since we see everything by reflected light. I like a mixture of electric and daylight; as daylight grows dim the electric grows brighter, making the illumination always uniform."

Dr. J. E. Colburn: "Reflected light. Better results, especially in the astigmatism tests. The transmitted light of equal intensity causes pain and blurring, with longer and more frequent rest."

Dr. A. O. Pfingst: "Reflected, it gives better definition of letters, in other words, the contrast between black and white is sharper."

Dr. J. A. White: "I use as a rule reflected lights. I use transmitted light some times, but it does not give as brilliant an illumination as the reflected lights."

Dr. Geo. M. Gould: "Your question is meaningless to me and according to my use of test-types. The tiring of the eyes is bad both ways with white background and black letters. I do not follow this ophthalmologically absurd method. I use cards put up on the physiologically correct principle of black background and white letters."

Dr. H. V. Würdemann: "Transmitted electric light through porcelain plates, always of uniform intensity, reflected light gives confusing reflections, on porcelain plates, paper charts fade, and the standard thus varies."

Dr. Melville Black uses transmitted light with revolving cabinet and says: "Sometimes when the electricity is turned off for a while I use reflected light or daylight, and invariably the patient complains or rather expresses relief when the electricity comes on again and the blinds are pulled down."

Dr. C. H. Beard: "Transmitted light, chiefly because of the absence of the many surface reflections, which are objectionable, in other methods."

Dr. Linn Emerson: "Transmitted, more uniform illumination of chart. No reflection from shiny surface of card."

Dr. F. H. Verhoeff: "Theoretically it seems to me that transmitted light should be more efficient, because it would obviate

lustre. However, I have never used it because I have not seen a practical method of doing so."

Dr. Casey A. Wood: "Transmitted light, because it seems to be less irritating to the eyes, both of the examiner and the examined."

Dr. F. T. Rogers, speaking of his cabinet, says: "The illumination, to my mind, is the most satisfactory that I have ever had, and inasmuch as I illuminate one line at a time, there is not the large white space to cause fatigue of the patient's eyes. They can look at it steadily without discomfort, whereas if all the lights are illuminated at once there is some annoyance."

E. L. Elliott, editor of the *Illuminating Engineer*, in reply to a letter relative to the illumination of test charts, says: "As it is impossible to secure actual normal daylight illumination in the majority of cases in which test-type charts must be used, an artificial light should be taken as a standard. Almost all objects are seen by reflected light. Luminous bodies form an almost infinitesimal portion of objects viewed. Translucent test charts which are practically luminous bodies should therefore be wholly discarded. In selecting a standard light source for illuminating test charts that one should be chosen which produces a light nearest in quality to normal daylight. Oil and gas flames and the incandescent electric lamps all fall far short of meeting this requirement, the light which they produce being orange yellow; that is, has far less rays in the blue and violet than normal sunlight. Fortunately there is a light-source available at the present time which approximates daylight to a remarkable degree. This is the acetylene flame."

The following arguments were used in support of reflected light:

- 1st. "We see everything by reflected light."
- 2d. "Nearer actual conditions under which we see."
- 3d. "Less irradiation."
- 4th. "Softer light more like daylight."
- 5th. "More even and easier on the eyes."
- 6th. "Transmitted light of equal intensity causes pain and blurring."
- 7th. "Contrast between black and white sharper"
- 8th. "Gives a more brilliant light."
- 9th. "The intensity may be controlled and measured more accurately."
- 10th. "In more general use and records can be better compared."

11th. "A greater variety of test cards may be used."

12th. "Transluminous test charts which are practically luminous bodies should therefore be wholly discarded."

In reply to the above arguments it may be stated that we *do not* "see everything by reflected light, nor is illumination by reflected light nearer actual conditions under which we see." In looking at a picture, reading a book, looking at objects lying upon the floor or upon a table, we see by reflected light.

In looking at a landscape or a marine view, or, for instance, in determining the position of a railway signal (semaphore), it is not the reflected light that enables us to make out the contour of a building, tree, ship or semaphore, but the light that comes from behind the object viewed; the blotting out of a portion of the illuminated background makes the object visible.

Irradiation is the "phenomenon of the apparent enlargement of an object strongly illuminated when seen against a dark ground." (Century Dictionary.) A white square surrounded by black appears larger and less sharply outlined, than a black square surrounded by white, under the same intensity of illumination. "The effect of irradiation is most manifest when the dark portion of the field of vision over which the irradiation takes place has considerable breadth."

There is certainly more irradiation from a card illuminated by a reflected light than from perfectly diffused transmitted light, otherwise the diffused daylight coming through our windows would cause more annoyance than the light reflected through the same window from some nearby building.

Light, as it emerges from translucent charts properly prepared, is much softer, more like daylight, and much easier on the eyes, because it is perfectly diffused. The orange yellow of the light source is to some extent absorbed or filtered out by the porcelain.

There is, however, a yellowish tinge to the transmitted light, and while it has been determined that the portion of solar spectrum from D to E produces the greatest bleaching of the visual purple, diminishing with diminishing wave length (red being least active, yellow slight, and yellow green greatest), there is no doubt as to the truth of Dr. Williams' statement that "Yellow paper seems to be more agreeable than white."

The *Illuminating Engineer*,¹ in referring to "Color of light as a factor in efficiency," says: "It is an easy enough matter to produce carbons which will give practically daylight values, but the efficiency is thereby cut in half. This is a physiological necessity

from which there is absolutely no escape. For every purpose therefore in which distinctions of color are not of prime importance, light of a distinctly yellowish color is likely to be the dominant artificial light for a long time to come. That a light of this color produces an effect that is agreeable to the eyes is a further point in its favor."

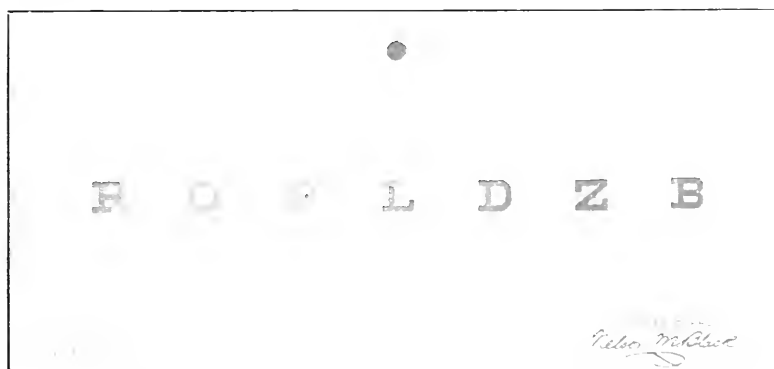
Tschering says: "Yellow occupies a special position among the colors and is that one of the spectral colors which, to the eye, seems to offer most resemblance to white."

William D. A. Ryan says: "Yellow light appearing to be easier on the eyes than white light is a matter of intrinsic brilliancy rather than color."

"The importance of subduing the intrinsic brilliancy of all light sources that come into the range of vision can not be overestimated. . . . A frosted lamp or diffusing globe, while actually reducing the amount of light given out, increases the illuminating effect; that is, enables the eye more readily and with greater ease to see the illuminated objects."

The difference between the effect of the intrinsic brilliancy of an area illuminated by reflected and transmitted light upon a sensitized plate is shown in the photographs. Both were illuminated by one 16 c.p. lamp with the plate at a distance of 42 inches.

Figure A, the chart illuminated with reflected light, was exposed 2 minutes.

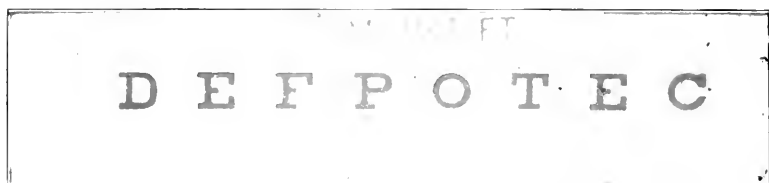


Illustrates the effect of reflected light on a sensitized photographic plate exposed two minutes at forty-two inches distance. Illumination one 16-candlepower lamp at nine inches. Letters begin to show effect of over exposure and are blurred.

Figure B, illuminated by transmitted light, was exposed 4 minutes. The plates were developed together in the same solution.

and for the same length of time. Figure A shows beginning haziness due to over-exposure, while Fig. B is clear and distinct.

The intensity of illumination with transilluminated charts need not be as great by a considerable amount to obtain the same visual acuity as with reflected light.



Illustrates the effect of perfectly diffused transmitted light on a sensitized photographic plate exposed four minutes at forty-two inches distance. Illumination, one 16-candlepower lamp at two inches. Letters are sharp, clear cut and distinct.

Testing with Williams' simplex photometer, I find I can distinguish the 6/V1 letters at 6 M. with the photometer set at 3 magnitudes, illuminated with transmitted light from 10 c. p. lamp, and with reflected light from a 16 c. p. O'Brien straight filament lamp the letters are blurred beyond the 2 magnitude mark.

The result of my personal experience is directly opposite to that of Dr. Colburn, *i. e.*, "That transmitted light of equal intensity (to reflected light) causes pain and blurring." It is softer and much more agreeable to the eyes of the examined and the examiner.

Contrast between black and white is much sharper with transmitted light. Compare charts.

Control of the intensity of the light is as easy with one method of illumination as the other, if electricity is the source. All that is necessary is to install a rheostat.

True, the illumination of test charts by reflected light is in more general use, but I do not think, eliminating the question of intensity of illumination, that records of visual acuity will suffer by comparison if transmitted light is used.

The variety of test cards that may be used with transmitted is as unlimited as with reflected light.

That "transluminous test charts are practically luminous bodies and therefore should be wholly discarded" is an argument that will not, as the old saying goes, "hold water."

Reflected light is necessary in order to appreciate the third dimension. Visual acuity as determined today is the measure-

ment of the visual angle by means of characters of a definite size, upon a strongly contrasting background, which is the same plane and is viewed from a distance. The length and breadth, or outline of characters and their component parts is all that is required for their recognition; the third dimension is not necessary for the purpose of testing visual acuity.

Transmitted light for illuminating test-type charts is the best for the following reasons:

(1) It is as near the actual conditions under which we work, in using the eyes for distant vision, as reflected light.

(2) By this method there is no irradiation with black letters upon a white ground.

(3) The light is softer and easier upon the eyes of the person examined and the examiner.

(4) The contrast between black and white is sharper and the letters are more strongly outlined.

(5) It gives a more perfectly diffused light free from confusing surface reflections and luster.

(6) The intensity may be controlled perfectly by means of a rheostat, and the measurement of the intensity of the illumination is as easy as with reflected light because the same means are employed (an illuminometer).

(7) The variety of test cards may be unlimited.

(8) As large or small an area of the chart may be illuminated as may be wished for.

(9) The letters being opaque are seen perfectly black.

Just a few words concerning Dr. Geo. M. Gould's "Cards put upon physiologically correct principle of black background and white letters."

I maintain the condition is physiologically incorrect for the following reasons:

1st. Dark characters upon a lighter background have been in use from time beyond recall, and the human eye has become adapted to this condition.

2d. The irradiation is marked.

3d. The characters appear larger and are not sharply outlined.

4th. Luminous points or small brightly illuminated areas tire the eye much more than dark areas surrounded by brighter ones.

5th. The production of disagreeable after-images.

6th. Tscherning says: "We can not identify the examina-

tions with the luminous points on a black ground with that made by means of a black point on a white ground."

A comparison of the two charts—one black letters on a white ground, the other white letters on a black ground, both having the same illumination—will quickly decide which has the greater irradiation.

METHODS OF ILLUMINATION WITH REFLECTED LIGHT.

A large percentage of ophthalmic surgeons have their charts illuminated in almost "any old way." A card is stuck upon the wall with from one to a half-dozen lamps of various candle power either at the sides or top and bottom of the card; usually tin reflectors are used to direct the light upon the card, and very little attention is paid to the angle at which they reflect the light.

Figure 1A illustrates a method of illumination. Meyrowitz, in his description of this cabinet, says: "Heretofore unless a comparatively large number of lamps were used, even illumination of

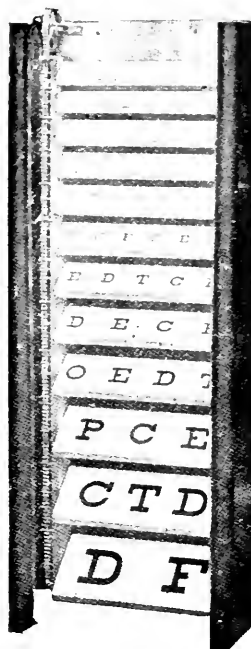


Meyrowitz's Illuminating Test-type Cabinet.

the card was not possible because of the limited area covered by a single lamp and shadows alternated with light areas. The four sides of the cabinet herewith presented contain mirror reflectors,

which cause an even dispersion of the light from the single 16 candle-power lamp in all directions so that the whole card is brilliantly and uniformly illuminated."

Dr. Chas. H. Williams² says: "The most satisfactory results have been obtained by hanging the card of test-types in a cabinet painted a dull black, the opening being three feet wide by four feet high. On each side of this rectangular opening, right and



Williams' Test-type Cabinet.

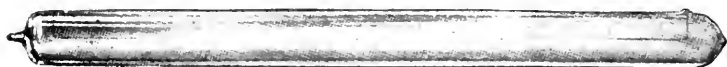
left, is arranged a vertical column of small incandescent lamps of 5 candle-power each, eight on each side, made to burn four in series on a current of 110 volts. Fig. 1B.

"These lamps are arranged at equal intervals, the highest and lowest being as near the top and bottom of the cabinet as possible, and are so placed that the lamps on one side come opposite the intervals between the lamps of the opposite side, thus making a more even distribution of the light. This vertical column of eight lamps on each side is protected by a blackened tin screen, so that no light will pass direct from them to the observer, but so that the full amount of light will be thrown on the test card. The lights are one foot in front of the plane of the test-types, and about

fourteen inches from the nearest edge of the card, and 'frosted' bulbs are used."

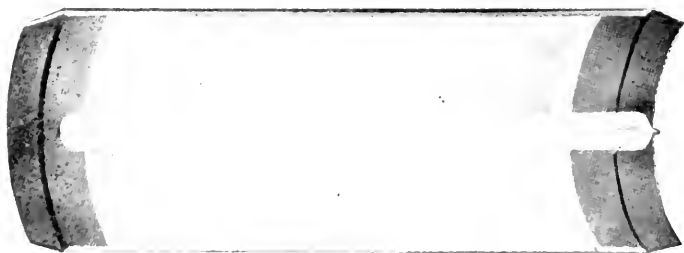
Dr. Mortimer Frank¹⁰ says: "The most common fault with the lighting of test-types is the improper care in the selection of the reflector and the position of the lamps." He has constructed a parabolic reflector which seems to meet the requirements perfectly, its only objection being the ungainly appearance of the apparatus, which I am sure the originator can improve upon. Fig. 2.

The O'Brien Electric Light Company, of Philadelphia, has devised a lamp, which together with the reflector furnished, about meets all the requirements in the use of reflected light for illuminating test-cards. The lamp is of clear glass tubing $7\frac{1}{8}$ inches in diameter, with the filament running straight the entire length, giving a solid line of light 12 inches long. There being no sockets used, there are no shadows of dark spots. Fig. 3.



The O'Brien Straight Filament Tube Lamp

The reflector is metal, lined with porcelain or opal glass, giving perfect diffusion of the light. Fig. 4.



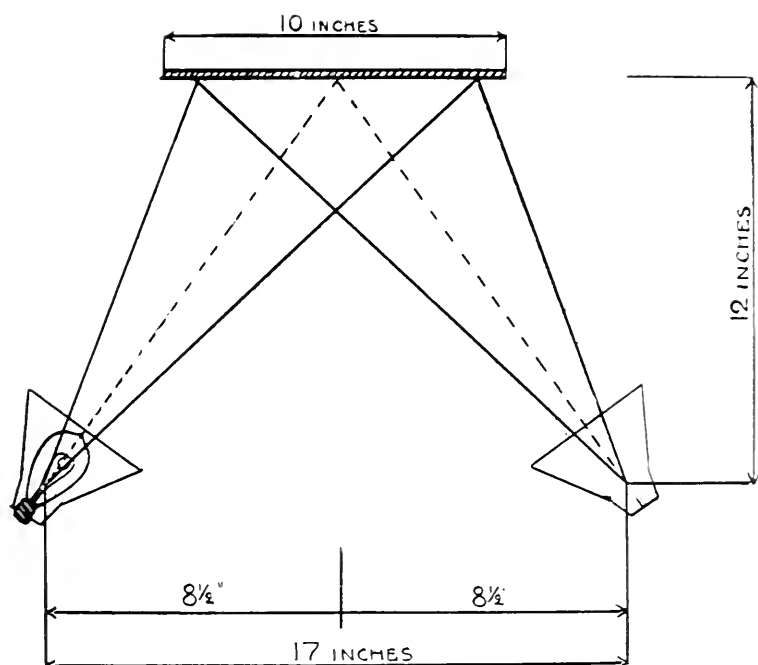
The O'Brien Lamp and Reflector.

The charts may be illuminated either by one lamp at the top and one at the bottom of the chart, or by one or two at the sides.

I use one of these lamps and cards having a single line of type upon them, hanging the card on the wall, the lamp being suspended from adjustable brackets, which allows it to be brought within four inches of the wall or removed to a distance of nine inches, and also permits tilting to any angle.

The engineering department of the Holophane Company gives the following scheme for illuminating a chart 10 by 25 inches:

"By placing the reflectors 17 inches apart and 12 inches back from the placard and pointing in the direction shown in the sketch, Fig. 5 (50° and 125°), you will receive even illumination, and at



Scheme for lighting a card by reflected light, suggested by the H. J. Lane Company.

the same time entirely hide the light from the person's eye being examined. The reflector should be painted with aluminum paint on the inside and black or green on the outside. The number of lamps used, for best purposes, would be 8 candle-power lamps, of which four should be placed on each side up and down; six can serve the purpose, however." Fig. 5.

TRANSMITTED LIGHT.

Hardy's 20th Century Testing Cabinet, Fig. 6, is one which is illuminated by transmitted light. The characters are printed upon paper, which, by means of two rollers operated by a string, allows one line of type to be seen at a time. This makes a good cabinet, but the paper becomes soiled and browned from the heat of the lamp, and soon becomes inefficient. Fig. 6.

The writer has been using for the past five years a luminous test-type cabinet which has given very good results. It consists of a wooden frame the four sides of which are mounted with porce-

lain translucent plates on which the test letters are engraved in dead black. The cabinet is illuminated by four incandescent lamps, of 8 candle-power each, which give a very uniform illumination of apparently sufficient intensity. The four plates, having white glazed backs, reflect and refract the light in every direction, so that practically none of the original illumination is lost, except what is absorbed in passing through the porcelain plate. The cabinet revolves on a central tube by means of a cord and pulleys, as shown in cut. Fig. 7. The objections to this cabinet are two: The surface illuminated is too great and has a tendency to tire the eyes, especially when examined under a cycloplegic, as does reflected light, although not to as great a degree. The number of lines of type exhibited at a time is confusing and it takes up a great deal of time to get the patient to attempt to read the line you wish.

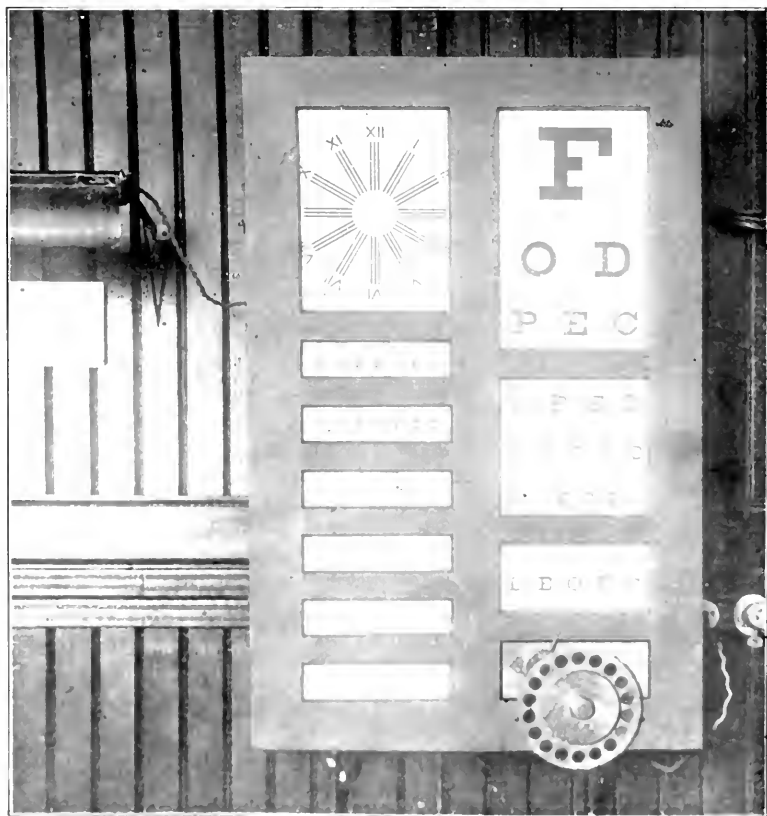
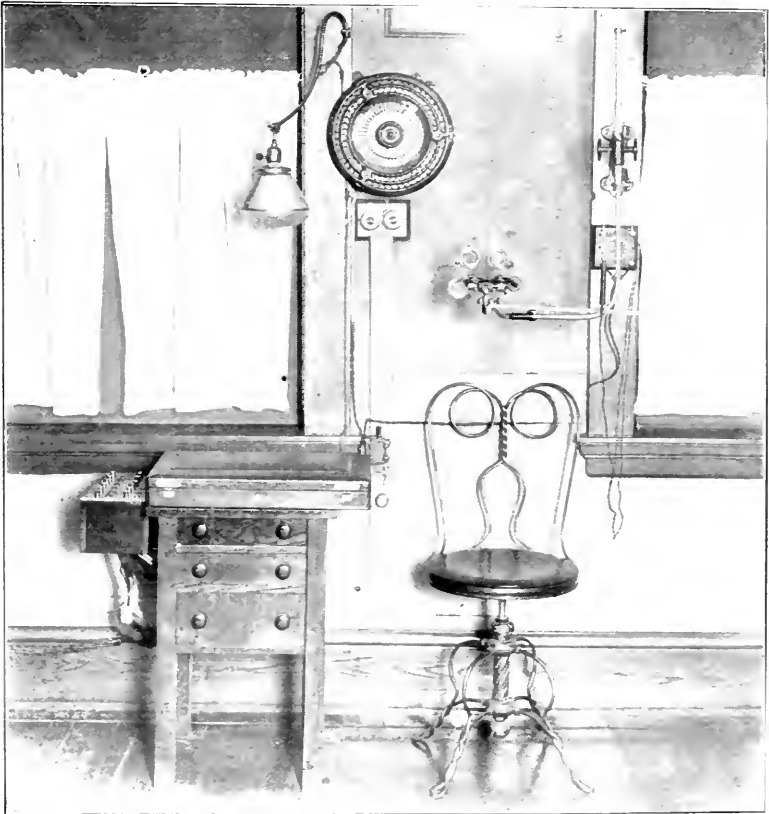


Fig. 7. Improved test type cabinet, designed by Nelson M. Black, M. D., with astigmatic and cylindrical test type and Weimer's test type for testing color vision.

The writer in the following described cabinet has attempted to overcome the above objections (Fig. 8):

The size of the cabinet outside is 21 by 32 by 17 $\frac{1}{2}$ inches, and is painted dead black. The left half is divided into seven compartments. The upper contains an astigmatic chart, the next two compartments contain letters for 6 VII $\frac{1}{2}$ vision; the next three have 6 VI letters and the last 6 V. The right side has four compartments. The upper contains letters for 6 LX, 6 XXX and 6/XX vision, the second compartment letters for 6 XV, 6 XII and 6 X vision, the next compartment 6 XII letters. The fourth compartment is fitted with an iris diaphragm for muscle testing and Williams' lantern for testing color vision. The inside is white enameled and the compartments divided by means of bright tin, which refract and reflect the light perfectly. The

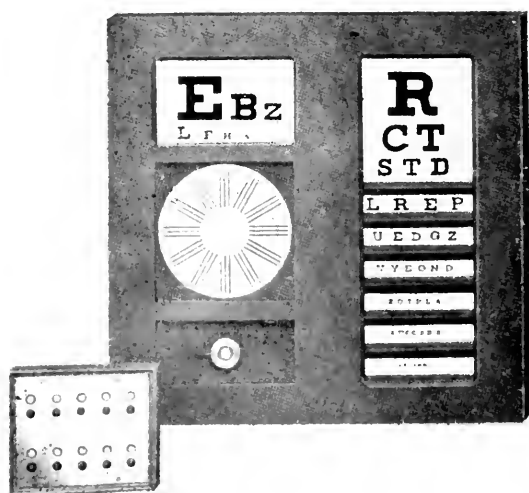


Showing refraction table with switchboard for operating different compartments of Transluminous test-type cabinet and rheostat for controlling intensity of illumination.

large compartments are lighted with two 10 c. p. incandescent lamps, the next smaller compartment with one 16 c. p. lamp, and the small division with one 16 c. p. lamp each. The lamps are each turned on and off by a switchboard at the refraction table, Fig. 9. The intensity is regulated by a rheostat, so that the illumination may be controlled at will. Much to my sorrow I learned, as I had almost completed my cabinet, that Dr. F. T. Rogers, of Providence, R. I., had preceded me by almost a year with the same idea.

Dr. Rogers' cabinet, Fig. 10, is 30 by 29 by 6½ inches in size.

The left half is divided into three compartments, the upper being used for the primary test, has nine single letters, decreasing in size, which enables the examiner to find what the acuity of



Rogers' Luminous Test-type Cabinet.

vision is. Next below is an astigmatic chart, and at the bottom, behind an iris diaphragm, is a white light for muscle testing, also a slide with red and green glass for railroad signal tests. The right side is divided into seven compartments. The six smaller openings have duplicate lines of type, which can be instantly dropped in or out of position as desired by the examiner. Each compartment is controlled by a switch at the refraction table.

Dr. D. Emmett Welch, of Grand Rapids, Mich., has devised a transluminous cabinet, which he has used constantly for the last three years (Fig. 11). He describes it as follows:

"My room is a darkened room. The letters are made after Snellen test-type, actual size. The 'board' is plate glass, painted

black with white letters, the same having a frosted tint. All letters, numbers, circles and lines are frosted.



Welsh's luminous test-type cabinet. White letters on a black ground. 1-9 actual size. The numbers are one side white, the other side dark green. The circles are two green, one white, and one red. The word "friend," f, i, n is in green, r, e, d is in red.

"The plate glass is 54 by 54 inches. Back of the same are electric lights, 8 candle-power. The glass rests in a frame composed of one side wall and window frame the other. Its depth is 10 inches. I manipulate the switch at 20 feet, illuminating all at once. This gives me: 1st, selection of letters for each eye, singly and combined vision; 2d, astigmatic test. 3d, Maddox rod test. 4th, to detect malingering, as you note the word 'friend,' alternate letters spell two words and are painted in red and green, so that by destroying the color by using alternately red and green glass over the examined eye it is readily found if the answers are correct.

The circles are for a similar purpose. The electric light below is for muscle test also."

I had the pleasure of seeing this cabinet while in Grand Rapids, and although it is an admirable chart, to my mind there are two objections to it: 1st, so many different characters seen at a time are confusing. 2d, the irradiation from the white illuminated areas is tiring.

The switchboard and rheostat I use with my cabinet, also control the illumination of a chart lighted with reflected light from a 16 candle-power O'Brien straight filament lamp. The two charts are side by side, so I have been able to make direct comparisons with all my patients as to the ease and comfort of the two methods of illumination, and the distinctness with which the two characters are outlined. Without exception the verdict has been in favor of transmitted illumination with black characters on a white ground.

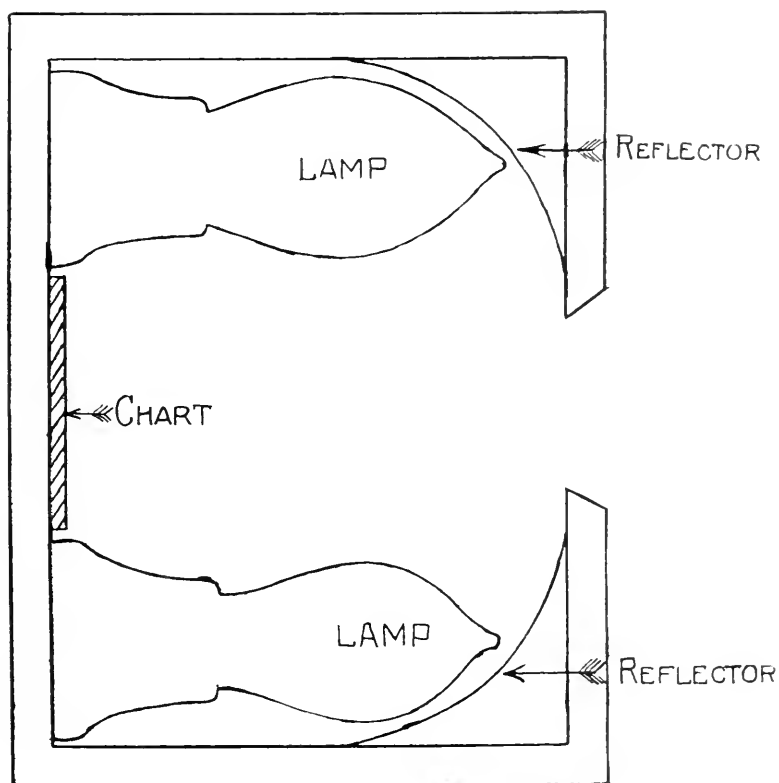
I wish to express my thanks to Mr. C. R. Gilman, electrical engineer, C. M. & St. P. R. R., for his advice and help in construction of the cabinet, and to the Cutler, Hammer Company, of Milwaukee, for the assistance in building a rheostat and for the loan of the one used in demonstrating this paper.

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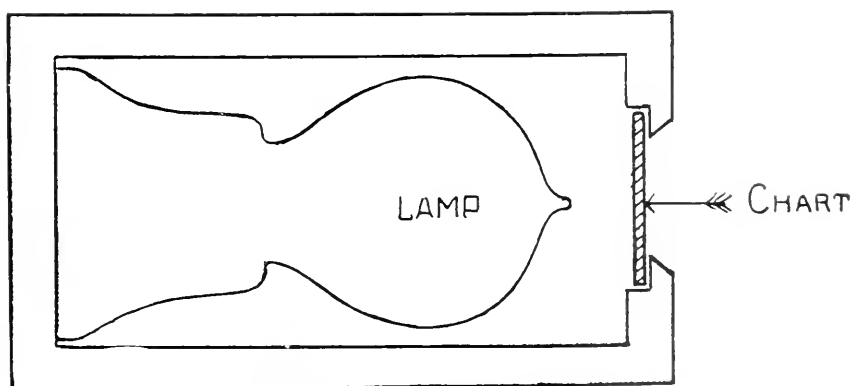
APPENDIX.

In corresponding with Dr. Rogers, I find the types in his cabinet are illuminated by reflected light, as shown by cross-section drawing.



Rogers' Method of Illuminating Test-type.

In my cabinet the letters are engraved upon porcelain and are illuminated from behind, as shown by the cut.



Black's Method of Illuminating Test-type.

REPORT OF A CASE OF RIGHT HOMONYMOUS HEMI-
ANOPSIA IN THE MACULAR REGIONS.

By Dr. WM. CAMPBELL POSEY.

PHILADELPHIA, PA.

(Illustrated.)

In June, 1904, the writer was asked to see H. N. W., a male 56 years of age, on account of a disturbance in vision which had come on five days previously, following what was thought to be a bilious attack. At the time of the attack, however, there was considerable dizziness complained of and some confusion of mind and speech, and though no motor or sensory symptoms followed, it is probable that an apoplexy occurred. Gradually after several days, as the mental symptoms cleared away in large measure, the patient, who was a great reader, noticed that reading was done only with the greatest difficulty, vision being apparently blurred to the right. Distant vision, on the other hand, appeared normal, the disability being only remarked in reading fine type.

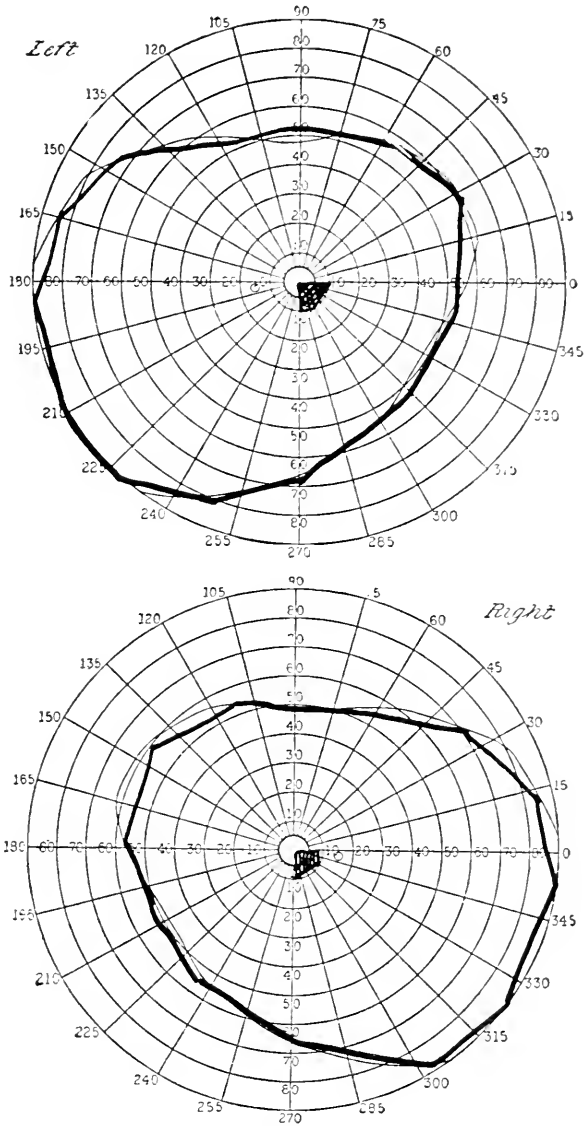
A careful functional examination of the eyes showed them to be normal in all respects save for a loss of vision in symmetrical areas in the macular regions of both eyes, as per fields. Both eyes were slightly hypermetropic, but corrected vision was normal in each.

The patient had been a sufferer from rheumatoid arthritis for years, and his physician, Dr. J. W. Lodge, of Merion, reported about 4-20 volume albumen in the urine. A careful eliminative plan of treatment was prescribed, Dr. James Tyson being called in consultation, and proper lenses for near and far were adjusted by the writer.

When seen three months later, the general condition had improved, though some pain was still complained of over the right parietal region. The difficulty in reading which was present at the first examination had cleared in a measure, though an examination of the fields showed them to be the same.

The writer has been consulted several times since for a readjustment of glasses, and the fields upon each occasion were found to have remained unchanged; reading being still pursued with great difficulty on account of the limited portion of type which was visible without moving the eyes. Distant vision, and the appearance of the fundi were both normal.

The writer was instigated to report this case, observed now some four years ago, by the appearance a few months ago (*Klin. Monatsblätter für Augenheilkunde*, July, 1907), of a paper by Wil-



brand, entitled: "The Macular-Hemianopic Disturbance of Reading and von Monakow's projection of the Visual Sphere." As summarized by Wilbrand from an analysis of eight cases observed by him, macular hemianopsia comes on suddenly, usually without accompaniment of other cerebral symptoms, central vision and color sense being normal, and the peripheral field of vision unaffected. There are no ophthalmoscopic changes. Wilbrand states,

however, that while in ordinary forms of complete and incomplete hemianopsia, orientation is much interfered with, and is one of the most marked symptoms of hemianopsia, in a hemianopsia involving but the macular region this symptom is absent.

Central vision is normal, the scotomata which are negative and very small and paracentral, being generally unobserved in distant vision. Great difficulty, however, is experienced in reading, especially of fine print. For in the act of reading, as Wilbrand points out, the finest details of the letters must be recognized. Thus, in ordinary reading, the initial letter of the first line is fixed directly, the rest of the word and perhaps the word following being seen by indirect vision. As soon as this impression is received, the eyes spring to the right and another initial letter is fixed directly, and what follows to the right indirectly. When the end of the line is reached the eyes make a longer jump to the left, beginning a new line below. Movements to the right are fewer when the subject is able to comprehend more words in anticipating the sense of the text. When in macular hemianopsia the scotomata lie to the right, there is difficulty in indirect vision and every syllable of each word must be painfully fixed; when on the other hand the scotoma lie on the left of fixation, there is great difficulty in finding the commencement of each line. When the letters are small, short words and letters disappear entirely.

As Wilbrand points out, it is not difficult to confuse the uncertainty and hesitation which subjects of this condition have in reading with dyslexia and alexia, this being particularly the case when the scotoma reach the fixation points, so that in all suspected cases, a rough test of the field of vision is insufficient and careful search should be made for scotoma by sufficiently small test objects.

Passing from the clinical consideration of macular hemianopsia, Filbrand then hypothesized regarding the lesions which might occasion such a condition and referred to Heubner's arrangement of the cerebral arteries into two systems, the basal and cortical. In the former, the vessels are given off from their parent stem like roots of a tree; in the latter, like branches of a tree. As a consequence the basal system is an "end" system, while the cortical forms a net-work of fine vessels. Wilbrand is of the opinion that the scotoma under consideration appear when an end artery in or near the cortical centre of the visual area becomes blocked up, and believes that the calcarine artery which runs in a deep fissure on the medial side of the occipital lobe, supplying the largest and most important part of the visual radiations, is the vessel

chiefly implicated. In two of his cases the probability of embolism was rendered likely by the presence of mitral and aortic insufficiency. In other cases, circumscribed, septic encephalitis and syphilitic disease of the vessels with thrombosis were possible causal factors. In another case the cause of the hemianopsia appeared more direct for in this instance a small iron screw, which projected about 13 mm. above the level of its support penetrated a woman's skull in the region of the left visual centre. When the thickness of the scalp and skull was considered, but a very shallow penetration of the skull cavity was possible. The wound healed rapidly and without complications other than the visual symptoms which appeared rapidly afterwards.

Wilbrand then combats at considerable length von Monakow's views of macular representation, which according to Spiller* are to the effect that the representation of the macula is not confined to the middle of the visual centre, nor its periphery; von Monakow contending that all parts of the occipital lobe and possibly even the posterior part of the angular gyrus are represented in the macular field, and that the macular field may extend far beyond the limit of the area usually recognized as the visual region of the cortex. Von Monakow does not accept Henschen's views that the macula is represented in the anterior portion of the cortex of the calcarine fissure.

This hypothesis of von Monakow's is rejected by Wilbrand, who summarizes his own views as follows:

1. There is an island shaped representation of the macula in the cortex.
2. That a distribution of the macular fibres over the entire surface of the visual sphere is not warranted.
3. That in this area of the cortex the transference of the irritation of the sensation is continued, and that the cortex therefore perceives that which was conceived to be vision.
4. The defect being permanent, it is doubtless true that the localization of the visual centres of the brain must be constant.
5. That there is no transference if irritation in the external geniculate body from a leading fibre to several or many projection fibres.†

Wilbrand was not the first to call attention to macular hemianopsia, for Mills in his text-book on "The Nervous System and its Diseases," (p. 760), published 10 years ago, referred to two

* "The Eye and the Nervous System," page 10.

†The writer desires to acknowledge his indebtedness to Dr. Frederick Krauss for his kindness in preparing the abstract of Wilbrand's article.

cases of this condition which he had observed personally. His reference to these in "The Eye and Nervous System," p. 108, is as follows: "Elsewhere I have recorded two interesting cases which seem to indicate that a very limited lesion of the cortical area for word-vision or of the tract leading to it from the lower macular centre, might cause a loss of vision for one-half of a word, which might be termed hemianopsic amblyopia. One-half of the central field is obscured or lost, the peripheral field being maintained, or it may be partially obscured. The patient is half blind for words. A word of more than four or five letters will only be half seen, or at least will be partially cut off, unless the patient turns his eyes so that the unimpaired half of the central field can take in different parts of the word in succession."

As there is no one better qualified to judge of the localization of cerebral centres than Dr. Mills and as the subject is not always fresh in the minds of ophthalmologists, it may not be amiss to quote several more of his paragraphs upon cerebral macular representation, as he has expressed them in the chapter on the "Cortical Centres" in "The Eye and Nervous System."

"In the higher visual zone, in the angular or angulo-occipital region, is also situated a cortical area for the macula. The lower macular area subserves clear vision in what might be termed its most primitive form. Luminosity, or, rather, whiteness and blackness, are here perceived; objects here first receive their clearest recognition. The centre, however, is purely perceptive; it is simply a part of the visuo-sensory area of Campbell and Mott. Natural objects, faces, persons, designs, words, letters or numbers are perceived through the functioning of this lower macular cortical area, but without a recognition of their significance; they are perceived, but they are not apperceived. Perception by the lower macular centre does not evoke concrete ideas the result of visual memories. Such visual ideas are the outcome of the activities of the higher visual field, including its macular subdivision.

"It is not improbable that there is for the macular field, as for the peripheral fields, a half representation, both primary or lower and secondary or higher, in each hemisphere; in other words, that a strictly limited lesion of the calcarine cortex on the one hand and of the angular region on the other may cause blindness in half of the macular field of the corresponding sides. At the same time, it is probable that this half macular representation is not so strictly defined by a vertical dividing line as is the peripheral retinal rep-

resentation. Putting it in another way, the macular centre of one side is more or less representative of the macular fields of both sides."

PROBABLE TUMOR OF THE PITUITARY BODY WITH OPTIC ATROPHY, FOLLOWING PREMATURE MENOPAUSE.

ELLA R. WYLIE, M. D.
BOSTON.

The following case, from its history and termination, seems worthy of report:

May 25, 1904, Mrs. E. T. P., age 26, consulted the writer regarding her eyes. Her general history was good, had always been well, excepting childhood diseases. Two years previous menstruation ceased permanently. Had been under treatment most of the time since then by regular physicians, hoping to re-establish menstruation, but without success. No symptoms of lues, myxedema or acromegaly.

No history of ocular trouble until six months previous, when she noticed a failure of vision in the right eye, and inability to read. Anteriorly, the eyes were normal. Vision was P. L. right eye 8/10 left eye, reading J. 5 with difficulty. Right eye fundus normal, optic nerve white, central vessels slightly contracted, tension normal. Left eye fundus normal, a questionable pallor of optic nerve, with central vessels normal, color sense and field of vision unimpaired, pupillary reaction and tension normal.

A=50 cyl. ax. 90, bringing vision up to 9/10, was ordered for left eye, to be worn constantly. No glasses were given for reading, complete rest of the eye at the near point seeming advisable. Patient was put upon iron and strychnia in ascending doses, alternating with the iodides, daily salt baths and a generous diet, and advised to live eight hours daily in the open air. After some weeks a decided improvement was manifest, which continued with treatment until September 7, 1905, at which time vision of left eye was 10/10 and she read J. 1 with distance glass. No improvement in right eye, she had gained twenty pounds in weight, had good color, and called herself well.

Did not see the patient again. Some months afterwards I learned through a friend of the family, that her condition had remained about the same, also that she had taken up Christian

Science, hoping to regain the vision of her right eye. The record of the following months, during which time she received no medical treatment, was failure of vision in left eye, intense headaches, together with general weakness, terminating in death August, 1907.

To Dr. M. F. Barrett, a local surgeon, I am indebted for the following information:

Several weeks prior to the end he was called in attendance, found her suffering severe paroxysms of pain in and around the right orbit and base of brain, with intervals of relief. Right eye total blindness, and great exophthalmus, preventing closure of lids. Left eye, perception of light, atrophy of optic nerve, no exophthalmus. Following the use of tonics, she rallied for a short time, then failed gradually, and the end came suddenly.

Diagnosis: Tumor of brain, probably of pituitary body. Autopsy not obtainable.

A WIRE LID-ELEVATOR FOR THE PREVENTION OF LOSS OF VITREOUS HUMOR IN THE OPERA- TION FOR EXTRACTION OF CATARACT.

BY DR. ERNEST MORAWECK.

LOUISVILLE, KY.

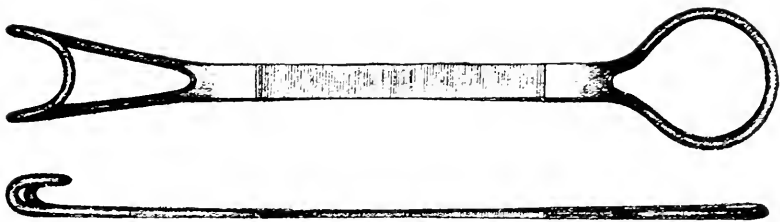
(Illustrated.)

The time required for responses to the many inquiries for information concerning the elevator I use in operations for extraction of cataract, has been necessarily interfered with by the press of other duties. I have therefore decided to reply to them through *THE OPHTHALMIC RECORD*, and in this general way, present the instrument I have used for a long time, being thoroughly convinced that it, at least helps to satisfy a pressing need, namely, the reduction of the danger of the greatly dreaded loss of vitreous humor in cataract operations.

At the meeting of the Ophthalmological Section of the American Medical Association at Atlantic City, June, 1907, it was the consensus of opinion among my colleagues, that the character of the speculum used is of the greatest importance. Personal experience has convinced me that one of the most frequent causes of loss of vitreous humor is the improperly fitting *spring* speculum and I am familiar with various makes used abroad as well as in this country.

The above sketch shows about the size of the elevator I use. It is 5-3/8 inches long. The hook is of No. 14, and the fingering of No. 15, Browne & Sharpe gauge, tempered steel wire, nicked, all parts hard soldered.

During the operation the assistant gently but firmly pulls and lifts both elevators until they stand well out from the eye, thus overcoming spasms of the obicularis muscle, which frequently cause rupture of the hyaloid, with inevitable escape of vitreous. The elevator is held in place by the assistant until the operation and toilet of the eye are complete, then, when the patient is commanded to look slightly upward the upper elevator is carefully re-



moved, this being followed by the disengaging of that of the lower lid. By the use of this elevator the danger of loss of vitreous, either through pressure of the speculum on the globe of the eye or from the careless removal of the spring speculum, is obviated.

Another feature in connection with this operation is the use of a heavy canvas sheet suspended on poles, similar to the army litter. In order that patient remain in the horizontal position this is placed under him before operating and he is lifted upon it to the bed when the poles are withdrawn. This sheet is used only in the operation upon the operating table.

Any further information regarding this elevator will be gladly furnished by the writer.

CAULBERT BUILDING.

Review.

RETRO-BULBAR CYST CURED BY KRONLEIN'S OPERATION WITH THE APPLICATION OF CARBOLIC ACID.

In the *Western Medical Review*, October, 1901, H. Gifford reports a boy of eight years who had a rapidly developing exophthalmos of the left side with considerable pain. Kronlein's opera-

tion revealed a dark-colored cyst within the muscle-funnel. On palpation this collapsed, with the escape of a dark brown fluid. Walls of cyst could not now be made out, so wound closed and healed well. Marked improvement of all symptoms, but after three months condition as bad as at first with vision about 20/100. Outer wall of orbit again resected and cyst wall fixed by passing thread through it. Wall of cyst opened, dark brown fluid evacuated apparently from two or three separate chambers; the interior swabbed out with 95 per cent carbolic acid, swab being passed back nearly or quite to end of muscle-funnel. Then cavity swabbed with alcohol. Temperature 102° after twenty-four hours, then reactionless healing. Practically complete cure of exophthalmos persisting more than a year. Vision 20/30 minus without correction; slight convergent strabismus. Nature of tumor uncertain; but without entering into this question, the important fact remains that the boy got rid of his cyst with the preservation of nearly normal sight.

New Books

The Human Eye, with two dissected Sectional Models in Colors, containing fifteen separate plates with a clear and detailed explanation of the various parts of the eye and their functions. Translated and adapted from the German of Dr. Securio, by R. M. Lockwood, published by Frederick Boger Publishing Company, New York. Price \$1.00.

The book contains besides a fair description of the orbit and its contents, two manikins lithographed in colors with 88 parts of the eye as dissected. These are moveable, and with a little imagination give a very good idea of the anatomic structure of the eye. The first manikin is an antero-posterior dissection and the second a superior-inferior. The book comes in very handy in explaining to intelligent patients with an inquisitive turn of mind, the location of disease or injuries. NELSON M. BLACK.

Reports of Societies

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting March 9, 1908.

DR. C. P. PINCKARD IN THE CHAIR.

Case of Suppuration in Right Temporal Region.

By Dr. C. Gavin. A successful operation was done. Two weeks ago the patient returned with marked protrusion of the eyeball (left) and gave a history of suppuration from the left naris. Two incisions were made between the globe and the lower lid, with the expectation of finding pus, but were negative. On the supposition that the suppuration originated in the left antrum an opening was made through the upper second bicuspid. Much cheesy material was found in the antrum. A second opening was made through the nose to get drainage. Next the patient developed an acute suppuration of the middle ear. The drum was incised and considerable pus evacuated, but the symptoms did not subside. The pain behind the ear increased, and radiated down toward the shoulder. A radical mastoid operation was done; the symptoms subsided, and a complete cure resulted. The pus was examined and only staphylococci were found.

Dr. A. H. Andrews was reminded of a case of orbital cellulitis, in which there was protrusion of the eye. A radical operation on the antrum relieved the condition entirely. An examination of the tissue showed carcinoma. The patient, a man, was only 31 years of age.

Chronic Chorioretinitis.

Dr. Geo. F. Suker presented two cases. The first patient, a syphilitic, had chronic chorioretinitis, of great extent, and yet vision under atropin is 20/20 in each eye. The choroidal vessels are markedly sclerosed. The blood tension varied between 160 and 170.

Retinal and a Subhyaloid Hemorrhage, with Marked Lesions in the Retina.

The second patient had a blind right eye. He had had a large retinal and a subhyaloid hemorrhage, with marked lesions in the retina. Repeated examinations of the urine failed to show albumin, until lately, when a very small percentage was found. Two weeks ago there occurred a hemorrhagic retinitis in the left eye, but not so severe as in the right. He considered it a typical case

of granular kidney, and nephritis secondary to arteriosclerotic process.

Dr. Frank Allport presented a boy, aged 20, below par mentally, but physically well. February 4, 1908, there appeared a swelling at the inner angle of the right eye. A physician in Iowa made an incision, but only dark blood flowed from the wound. Moist compresses were applied, but the swelling rapidly grew larger. Another large incision was made two weeks later, but only blood flowed but in large quantity. The swelling rapidly increased in size. The patient's personal history is negative. The accessory sinuses were all gone over carefully; there was no ear trouble, mouth, throat and nose were healthy. He thought that it was either a rapidly growing sarcoma, or a thrombosis of the cavernous sinus, but the symptoms manifested were not typical of either condition, partaking of both.

Dr. William H. Wilder thought the theory of a rapidly growing neoplasm was more plausible than that it was an affection of the cavernous sinus, inasmuch as there were no symptoms of exophthalmus. Relief has been afforded in such cases by ligation of the internal carotid artery, although the condition, he thought, was sufficiently grave to warrant an exenteration.

Dr. H. B. Young reported the case of a young man who, following a gonococcus infection, developed a staphyloma in the left eye, which was abscised. Later he had pain in the right eye, which subsided after a few days. The iris gradually changed to a dirty gray color. Examination showed a dark brown exudate behind iris, above pupillary space, which gradually spread downward. The left eye was enucleated, but the process in the right eye continued until the pupillary area was entirely covered. The iris was like a dirty curtain. There was no pain. Vision finally increased in the right eye. A paracentesis was done but was not satisfactory, and an attempt to cut the iris at its anterior border failed. Within 48 hours, however, the tension receded, and since then had given no trouble. The patient has good perception of light and projection in all directions, and has some faint sense of objects. The question, he said, is, what should be done to give better sight, and when.

The iris is probably tied down to the lens above and the cornea below, and the probabilities are that any attempt to increase vision would include removal of the lens. The only feasible operation, he thought, was corneal section, removal of the lens

and as much of the iris as possible. The condition is probably a sympathetic iritis and not a pure iridocyclitis.

DISCUSSION: Dr. Geo. F. Suker thought that there was a iridocyclitis, as there could not be such marked involvement of the iris without some involvement of the ciliary body. He thought that Dr. Young was justified in attempting to clear the cornea as much as possible, and to do later an iridectomy with extraction of the lens. Cocainize the cornea and flush the eye with as hot a solution of normal salt as the patient can stand, using about a pint at each irrigation, once or twice a day, or oftener. Subconjunctival injections of dionin or hypodermic injections might prove useful. He complimented Dr. Young on his success in the case.

Dr. Oscar Dodd also believed that there is always a severe cyclitis in these cases, in spite of the location of the tenderness and the minus tension. He thought that in these cases atropin is extremely useful, in the form of an ointment containing four per cent of atropin and ten per cent of cocain. It will quiet the tension better than anything else. The reason is that it lessens secretion from the ciliary body and it also lessens the pain.

As regards the time for doing an operation, he advised waiting as long as the condition of the eye is improving under treatment. The salicylates have some value in these cases, subconjunctival injections some, dionin a little, but these things must be varied in order to accomplish something.

As far as results are concerned, it is necessary to remove as large a piece of the capsule and iris as possible, wash out the lens, and later do an iridectomy. As long as the tension is keeping near normal and the congestion is lessening, it is well to wait for months before attempting to do anything more.

Dr. Young stated that a two per cent atropin ointment was being used and that a true plastic cyclitis, with the formation of new tissue, was not present, so that whatever condition affected the ciliary body was a secondary affair. It was not a true iridocyclitis.

Papilloma of Conjunctiva.

Dr. Thomas Faith reported the case of a man, aged 38, with good family and personal history, who had been treated for trachoma and was operated on a number of times by other oculists. When he first saw the patient, the right upper lid was covered by a fleshy tumor, resembling an exaggerated granular conjunctivitis, which on section proved to be a papilloma. The patient was treated with the X-ray, and after four months the growth had disappeared and it has not returned after three years.

Discussion: Dr. E. F. Snyder recently saw a case of a large sessile growth growing from the inner portion of the cartilage of the right eye, pink in color and raised about 2 mm. from the surface. It had been there for several months, not increasing in size and giving the sensation of a foreign body in the eye. The tumor with the cartilage was removed and has not recurred. Clinically the tumor resembled a papilloma. The pathologic report has not yet been made.

Etiologic Significance of Angeiosclerosis in Certain Type of Fundus Lesion and Cataract.

Dr. George F. Suker stated that arteriosclerosis and age are no longer synonymous conditions, because the former occurs in the young as well as in the old. Any acute infectious disease may leave its imprint on the blood vessels and eventually, given due proper impetus, terminate in arteriosclerosis, either local or general. It is generally believed that the condition effects first the end arteries, of which typical examples are found in the eye. Ordinary senile cataract he regards as an expression of arteriosclerosis, the result of malnutrition and local autointoxication. Opacities begin in the lower part of the lens, probably the result of gravity, and disseminate from below upwards. He thought that in glaucoma the arteriosclerotic process was going on in the posterior part of the globe, with marked changes even in the ophthalmic and retinal arteries.

Retinitis albuminurica unaccompanied by any active inflammatory reactions in the retina or choroid occurs more often with the granular kidney, the latter frequently being a sequence of the arteriosclerosis whereas the parenchymatous nephritis is not and the retinitis is frequently of an intense inflammatory character. More often acute retinal and choroidal inflammations, optic neuritis and choked disc are seen in parenchymatous than in interstitial nephritis though the latter is by all odds the more common clinical manifestation. The reason he assigns for this is that in the granular kidney the urinary secretions are more copious, less excessive increased blood tension nor as great a toxic circulating element as in the parenchymatous nephritis.

Penetrating Wound in Both Eyes Identical in Character.

Dr. Paul Guilford reported the case of a man, aged 23. While winding wire on a wheel, the wire broke and struck him in the left eye, penetrating the center of the cornea and lacerating the anterior capsule of the lens. Under appropriate treatment the

symptoms subsided, but later a cataract operation was necessitated by a partial absorption of the lens. Three years afterward precisely the same accident occurred, the wire striking the right eye, causing a traumatic cataract, which was treated as before. In neither instance was the iris injured, nor was there serious disturbance of the vitreous or fundus, and in both eyes there was a small central corneal opacity which interfered to some extent with vision.

DISCUSSION: Dr. Oscar Dood stated that Dr. Bruns, of New Orleans, has been in the habit of filling the conjunctival sac with argyrol solution after cataract operations with exceptionally good results.

Dr. Frank Allport has used argyrol for years in all his cataract operations. The eye is first thoroughly cleaned and, before making an incision, a 25 per cent argyrol solution is instilled over the cornea, and when the operation is completed a drop or two of argyrol solution is placed directly over the incision. In severe cases of injury of the eyeball and in apparently hopeless cases, he fills the eye with argyrol, with excellent result, frequently saving an eyeball that appeared to be beyond saving. He has not had a case of staining from its use.

Dr. H. B. Young cited the case of a man who had both eyes injured in the same way while chopping kindling, but he did not come to Dr. Young until after the second injury. The eyeball first injured was shrunk and there was a double dacryocystitis due to gonorrhea. The patient had a hypopyon keratitis for which a semi-section was made. After the eye had quieted down, there was found a beginning cataract and in due time it was extracted and a panophthalmitis resulted.

Dr. E. F. Snyder read a paper on the

Morax Modification of Snyder's Operation.

Dr. Wm. H. Wilder reported a

Case of Parinaud's Conjunctivitis.

Dr. E. V. L. Brown thought that the possibility of tuberculosis must be considered in this case, and that some of the spots suggested it. He suggested trying the von Pirquet skin reaction in the case.

Dr. E. F. Snyder reported a case almost identical with Dr. Wilder's, occurring in a boy aged 4 years. The conjunctiva was covered with granulations and there was a slight corneal in-

volvement. The glands did not break down. Smears showed the tubercle bacillus.

Dr. Thomas Faith asked whether it is the rule for the glands to become enlarged before the onset of the conjunctival disease.

Dr. Wilder suggested the possibility that Parinaud's disease is a form of tuberculosis, even though there may be no evidence of the germ but simply the histologic appearance of the tissue. In his case only staphylococci were found in the smears made of the gland secretions. Most of the cases reported have shown disease of the conjunctiva before or coincident with the gland swelling. The history in his case was rather indefinite, except that when the swelling of the face was noted, the eye was slightly red.

Case of Recurrent Iritis.

By Dr. W. O. Nance. The interesting feature in this case was that the patient had suffered from seven attacks of iritis in ten years. His family history was good, except that his mother had had sore eyes during her pregnancy. Personal history was negative, except for an attack of rheumatism three years after the first attack of iritis. There is no evidence of tuberculosis. During each attack he received injections, and the trouble promptly disappeared.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 21, 1908, in Denver.

DR. WILLIAM C. BAXE, Presiding.

Dislocated Lens in Anterior Chamber.

Dr. G. F. Libby presented a man of twenty-two, with a transparent lens dislocated into the lower part of the anterior chamber, following by many months a perforating wound of the lower lid and eyeball, with multiple lacerations of the iris, which was displaced and adherent.

There was a corneal ectasia about 1 mm. in diameter at the lower corneo-scleral limbus, showing the seat of the perforation of one and a half years before.

The patient had pulled the steel splinter out through the skin of the lower lid, half an hour after the accident. It was from the cutting edge of a cold chisel, and measured 22x4x1.5 mm., with sharp points. R. V. 1/10 on March 3, 1908, when he presented himself for examination and treatment for pain that had first appeared one month before, and still persisted.

Tension was normal, but the eye was moderately injected and irritable. Extraction of the dislocated lens was advised, but not consented to by the patient. Atropin, hot applications and dionin were applied with benefit for eighteen days, when the case was presented to the society.

DISCUSSION: Drs. Davis, Neaper and Sisson thought extraction feasible. Dr. Coover suggested the continuance of dionin in the hope of absorbing the lens. Extraction through a low peripheral incision was deemed by Dr. Jackson to be the only operation, although the eye might be worse afterwards. He had seen this case eleven days before; and thought the lens seemed to be contracting. Dr. Strickler would continue the dionin, hoping for absorption; and would not operate unless the pain persisted.

Dr. Strader, who saw this case within 24 hours after the accident, then noted a prolapse of the iris, which increased in the following ten days, but no dis-location of the lens.

Dr. Black saw the patient about ten months after the accident, when the lens was not noticeably dislocated. He believed the lens was now subnormal in size; but with Dr. Bane, could not see how dionin would affect absorption. Dr. Bane tested with the sideroscope for steel within the eye. Result negative.

Note.—Two weeks later the eye was free from pain and irritability, under continuance of atropin, heat and dionin (increased from 2½ per cent once daily to 5 per cent twice a day), and the lens had further shrunken one-half to two-thirds.

Ophthalmoscopy of Frogs' Eyes.

Dr. A. C. Magruder presented two live frogs, the ophthalmoscopic examination of whose eyes clearly showed the movement of the blood corpuscles in the arterial, capillary and venous circulation of the retina. The arteries were smaller and of lighter tint than in the veins, the capillaries were decidedly whitish, and the fundus was pale; but the disk was plainer to the imagination than to the eye of the observer.

It was a novel and most interesting demonstration.

Symblepharon.

Dr. G. H. Strader reported dissection of symblepharon bands and the placing of a Tiersch graft to prevent the reformation of the adhesions, with success for a time, but final obliteration of the sac.

DISCUSSION: Dr. Coover used a Fox conformer, and Dr. Ban-

lead foil for four or five days, to prevent re-attachment of the adhesions.

Dr. Neepor related a case involving the conjunctiva and upper third of the cornea, in which a paraffin plate worked successfully after operation.

Glaucoma with Vomiting.

Dr. F. R. Spencer reported a case of glaucoma in a miner 66 years of age, in which nausea and vomiting were very marked symptoms. The patient was first seen about February 1, 1908, by Dr. G. H. Cattermole, who was called to treat him for the nausea and vomiting. A thorough examination failed to reveal any abdominal symptoms to account for his condition.

Dr. Cattermole found a slight pericorneal injection of the left eye, with elevation of tension and cataractous lens. The patient at this time, complained of pain in the left temporo-orbital region.

Dr. Spencer was called in consultation, February 5, and found a slight pericorneal injection of the sclera; tension about $+2$, complete cataract, dilated pupil which did not react well to light, and a hazy cornea and aqueous.

The patient stated that he had experienced three or four similar attacks during the past twelve years, and that the vision of the left eye had gradually failed. As the light perception was questionable and the patient's suffering was very great, an iridectomy or posterior sclerotomy was deemed inadvisable, but enucleation was advised. The eye was enucleated under general anesthesia, February 8th.

The report from the pathological laboratory of the University of Colorado showed chronic non-inflammatory glaucoma with marked stretching of the sclera.

There were no signs of malignancy.

The interesting features of this case were the persistent nausea and vomiting, which resisted medication, and the complete absence of any sign of glaucoma in the other eye. De Schweinitz mentions nausea and vomiting in connection with glaucoma and the cataractous change secondary to this disease. He also mentions the fact that the other eye is not so likely to be involved in case cataract accompanies glaucoma.

Six weeks later the patient was enjoying the best of health and stated that he was better than for over two years.

Secondary Cataract Knife.

Dr. Melville Black reported a cataract operation showing the value of his secondary cataract knife. The eye was so deep-seated that it became necessary to rotate it nasally in order to make counter-punction. On rotating the eye back, the aqueous escaped and the iris folded over the knife so as to prevent completion of the section without exercising the iris, which accident was overcome by replacing the Graefe with the secondary knife. He also reported cataract operation for a lens which had been opaque fifteen years. Capsulotomy was followed by a gush of milky fluid, but neither cortex nor nucleus was found. The capsule was extracted.

GEORGE F. LIBBY, Secretary.

OPHTHALMIC SECTION, ST. LOUIS MEDICAL SOCIETY.

Meeting of December 11, 1907.

A Case in Which, to Cure a Lachrymal Abscess, it Became Necessary to Make a False Passage (Patient).

By Dr. W. H. Luedde. Three years ago this man was struck on the nose with a baseball bat. The compound fracture of the bones was dressed by a physician. Five days later the sutures were removed. There has been some discharge of pus ever since. He has received no treatment during this time. There was a small sinus at the right side of the nose from which pus discharged. Considerable swelling of lower eyelid and cheek at inner end. I passed a No. 4 Bowman probe to the upper end of the lachrymal canal by the upper canaliculus. Pressure on the probe caused a flow of thick pus from the sinus. I injected a 1/5 per cent silver nitrate solution, washing out the abscess cavity freely and continued to wash it out every second day. Trial with No. 4 and 6 probes showed no communication between the upper end of the lachrymal canal and the nose. On the 9th day, because the fistulous opening was becoming obstructed, there was a slight extravasation under the skin. Following this extravasation I continued to use only a normal saline solution, simply to know that the abscess cavity was being emptied. The tenderness ceased very quickly and the swelling went down so rapidly that it looked as if I had used some special remedial agent. The fistulous opening closed five days later and the discharge became much less. There was no longer a purulent secretion. It consisted of a quantity of glairy mucus. I continued the injections of normal saline solution into the cavity, the return flow being by the lower punctum.

Attempts to pass probes to the nose were unsuccessful. I then sent the patient to Dr. Sluder for a nasal examination, who found a very large, overhanging, hypertrophied turbinate. After he had shrunk the turbinates I attempted again to pass the probes and was at last able to do so by raising the tip slightly and passing it forward. A copious epistaxis showed that it had passed into the nose. This was a No. 1 Bowman probe. I could not pass the No. 2 probe. Two days later the injection employed trickled into the nose so that the patient could taste the solutions. I have continued probing at intervals of a week, using the Nos. 1, 5 and 6 Bowman probes, and during one interval of two weeks the canal has remained perfectly open, solutions injected by upper punctum passing in a stream to nose before probe was passed. I think that in this case there is a false passage, which was the only available passage under the circumstances. There was a mechanical obstruction, the result of trauma. Natural relations were disturbed. The treatment was simply mechanical. I do not think much importance attaches to the solutions used. A question that might come up is what to do with this depression at the sinus. After the first week, when there seemed no chance of going through to the nose, I advised him to have the lachrymal gland removed, but he was unwilling and I did not insist. I shall feel more inclined toward this conservative line of treatment in the future as the result in this case has been so satisfactory.

DISCUSSION: Dr. J. Ellis Jennings said that the practical question was how long would the passage remain open. He had treated many lachrymal cases and had found that in the presence of a bony stricture it was almost impossible to keep the duct open and treatment was very unsatisfactory. The quickest method would be the removal of the lachrymal sac. Unless probed every ten days it would not stay open very long.

Dr. Green stated that possibly the introduction of a gold style might be of assistance in this case. In a case of simple stricture of the duct, he had made a little impression by probes alone but a permanent opening was effected by the use of a lead and then of a gold style, as suggested by Weeks. One question that this case brought up was in regard to the danger of such a puncture through an infected sac leading to nasal or even orbital infection. Possibly the injection of paraffin might remedy the depression in the cheek.

Dr. Barck did not believe this opening would remain open unless the probing was continued indefinitely. Furthermore, he considered it dangerous to go through the bone so near the eth-

moidal cells. The infectious material might be carried into the maxillary sinus. As to the use of the styles, they should be put in only far enough to permit touching the upper end. To heal in little canulas of gold was quite the fashion of the seventeenth century, and the French surgeon, Dupuytren, stated that he had had to remove some half hundred of them, because they made inflammatory symptoms afterwards. While many cases could be cured without the removal of the lachrymal sac, in others it was absolutely impossible to give relief without such a procedure. He could **not** understand the statement made by Dr. Theobald, of Baltimore, in his text-books that he found it never necessary to extirpate a lachrymal sac. But to say that extirpation of the lachrymal sac in every case was necessary, was going too far.

Dr. Luedde believed that some of these cases got well and remained well. He felt he would rather take chances on a **constriction in a bony canal** that remained open two weeks at a time, than he would with obstruction in a canal in soft tissues. This opening being through the wall of the bony canal did not jeopardize the ultimate successful issue. If this opening into the nose had been above the inferior turbinate there might have been danger of infection of the antrum or accessory sinuses, but the opening was below and not above the inferior turbinate, and there was no reason to anticipate trouble from these sources. The passage was not made until every other attempt to pass the probe had been a failure.

Degeneration of the Choroid (Patient).

By Dr. E. H. Higbee, Jr. This is a case of degeneration of the choroid that is rather remarkable in its extent. There is scarcely any of the choroid that has not been inflamed and degenerated, yet the choroidal vessels, especially the layer of larger vessels, are very plain and do not seem to have undergone any particular change, ophthalmoscopically. There is secondary atrophy, following a neuritis; this atrophy seems to be stationary now, as he has had about the same acuity of vision for the past year. The condition is of syphilitic origin and I show the case because of the amount of destruction of the choroid and the good picture it gives of the choroidal vessels, and the fact that he still has vision of 14/75.

DISCUSSION: Dr. Post said that the patient was a railroad engineer. He was now 43 years old and had run an engine up to about three years ago, which was the first time he had noticed any trouble with his sight, so the development of the condition must

have been gradual. There was a history of specific infection fifteen or sixteen years ago. Whether the patient had been treated for that, the speaker did not know. It appeared to him to be a case of specific infection where the retina was involved, and he believed it had been a syphilitic retinitis at the start and was now a chorio-retinitis.

Rupture of the Sclera (Patient).

By Dr. C. Barek. This patient was injured about three weeks ago. There was a rupture of the sclera about 1 mm. wide encircling the cornea for about one-third of its extent with an enormous hemorrhage into the anterior chamber. A large amount of blood has been resorbed, the iris is retracted backward, and the scleral wound is considerably wider now. The question comes up whether the crystalline lens is lying in that scleral wound. He had seen a similar case where the lens was lying partly in and partly out of the wound. He simply removed the lens and saved a certain amount of sight. The question arises, whether it is advisable in this case to remove the lens.

Localization and Removal of Piece of Copper from the Eye.

By Dr. J. Ellis Jennings. Geo. A., aged 22, consulted me October 12, 1907, and gave the following history: One month ago at St. Joseph, Mo., while watching a companion shoot at a mark with a .22-calibre rifle, felt something strike the left eye, presumably a piece of cap from the rifle. In a short time violent inflammatory symptoms set in with severe pains, which has persisted up to the present time. Several ophthalmologists were consulted, a skiagraph was made by Dr. Wells, which, showing the presence of two foreign bodies, he was strongly urged to have the eyeball enucleated. This he refused to have done. When he consulted me, I said that he had had the best advice and that the only thing to do was to have the enucleation done at once, that there was no chance of restoring vision in that eye, and the other was in great danger. He would not consent, but stated he wanted me to make an attempt to remove the foreign bodies. He handed me the chart locating the foreign bodies made by Dr. Wells. One foreign body was $1\frac{1}{2}$ mm. in diameter, located in the ciliary region on the nasal side, 5 mm. below the horizontal plane. The other not larger than the point of a sharpened lead pencil, was some distance behind the first. As no harm could result from an attempt at extraction, I made a section down and in 2 mm. behind the limbus at the point indicating the larger foreign body. I re-

moved a small bit of iris and the foreign body came away with it. I failed to find the smaller piece and then bandaged the eye. I still urged enucleation and, as the pain continued, he finally consented, and the eyeball was removed October 15th, three days later. A few days ago I told Dr. Wells that by means of his chart I was able to remove a piece of copper from the eye and would report the case to the ophthalmic section. As the patient had carried away the plotted chart, I asked Dr. Wells to send me a duplicate. He made a second chart and in it localized the second foreign body outside of the eyeball between it and the orbital wall. From a rough drawing of the original chart, I made on my history card, I am sure the second foreign body was in the eyeball. So yesterday I made an anteroposterior section of the eyeball and after a careful search found it midway in the vitreous embedded in the vitreous. I have not attempted to remove it from its position or to feel of its consistency, as I would like the members present to see it in situation.

DISCUSSION: Dr. H. P. Wells, referring to his failure to localize the smaller piece of copper, had consulted his plates again and found that the smaller piece which he had localized in the first chart was not as clear as the larger piece. There were three or four little translucent spots in the immediate locality of the foreign bodies, any one of which might have been taken for the smaller piece. When making the chart that he had sent to Dr. Luedde, he had evidently taken one of these into account and in making the last chart, which was sent to Dr. Jennings, he had taken one of the others into account. The slightest motion of the eye during the exposure would affect the image in the case of so small a particle. But the fact remained that in the second plate there had been nothing that he could clearly identify as being the shadow of the smaller body. As to the indicator wire covering the foreign body, as mentioned by Dr. Jennings, that was not a possible explanation, for even if the piece had lain immediately in that line in the first exposure, the second exposure was made at a different angle, and it was in the second exposure that the clear image could not be found. Furthermore, if he remembered it correctly, the smaller piece did not lie in the median line, as did the indicator wire.

Dr. Wells was far less interested in the successful cases than in those showing discrepancies, and he sincerely hoped that the gentlemen would always advise him when any of his charts failed to agree with the surgical findings. If Dr. Wiener were present,

he feared that the doctor would contribute another piece of evidence against him, for he recalled one case in which he had found a foreign body near the upper posterior wall of the globe, yet in which case the vitreous cleared up entirely and the doctor could see no foreign body with the ophthalmoscope. This case was subjected to a subsequent examination which located the foreign body about 2 mm. farther posteriorly than in the first localization, placing it just outside the eye. The technical difficulties in this work were numerous, as for instance, the patient might move the eye, or might fail to keep his sight centered on the spot and thus lead to an error or blurring of the image. Or if there was any condition that interfered with co-ordination of vision, that would also have to be taken into account. Yet in upwards of a hundred localizations he had not had a case brought to his attention which pointed seriously to any great danger of error that could not be overcome by a sufficient amount of care in the work.

Dr. Barek asked if the radiograph had been taken after the removal of the first piece of copper, or before.

Dr. Jennings replied that it was done before the removal of the first piece.

Dr. Barek thought the foreign body was probably not now where it was before these manipulations.

Dr. Jennings agreed with Dr. Barek that the foreign body had probably changed its position, but according to the last chart made by Dr. Wells, the second piece was not in the eye at all. Dr. Wells made the first chart about three weeks after the injury. It was easy to understand how there might have been an inflammation and the body as a result pretty well fixed in its position. Then the picture was taken and one piece removed, but a pulling of the tissues forward would not displace the other foreign body backward, so that the position of the copper, if it had been changed by the manipulation, would be forward.

Dr. Wells had no doubt at all that in the first place the smaller body was shown clearly, but he would be utterly unable to locate it accurately unless it showed in both plates.

Tumor of Cheek Adjacent to Lower Lid (Patient).

By Dr. H. Muetze. The patient, a boy 13 years old, was struck on the right side of his nose by a baseball bat in June. Soon after the right eye began to water and a swelling appeared between the inner canthus and the nose. It grew very rapidly and the family physician, who was consulted about two months

after the injury, referred the case to me, September 11th. When I saw the patient the tumor was quite large. It extended from the roof of the orbit to the wing of the nose and from the root of the nose it encroached considerably upon the eyeball. It felt soft like putty, was immovable and aspiration proved negative. The patient stated that since the last few weeks the eye had not watered any. Removal of the tumor was proposed under ether anesthesia in the latter part of September. I succeeded in dissecting it out without difficulty, until the superior posterior portion was reached, which seemed to be tightly adherent to the bone. Here the cystic wall of the tumor ruptured and part of it had to be removed by curette. The sac contained no fluid but soft tissue, the consistency and appearance of which reminded one of adenoid vegetations. The anesthetist unfortunately lost the specimen, which was given to him for examination by the pathologist. The wound healed by first intention and I was beginning to congratulate myself upon the good result, when one day I noticed that the right eye was watering some. I felt for and found what I thought to be the tear-sac with thickened walls resembling a small bean in shape and size. I immediately sounded the canal, which procedure was both difficult and painful, and have continued so until recently.

The little tumor, however, continued to grow, until it has attained the size and shape of a small Brazil nut. Another soft tumor has formed extending from the inner canthus towards the root of the nose. About the size of a marble, it fluctuates, does not appear to communicate with the larger tumor, and aspiration has proven negative. I do not think that the tear sac was destroyed at the time of the removal of the first tumor, else it would not have been possible to sound the canal afterwards.

DISCUSSION: Dr. Luedde thought this to be a tumor involving the connective tissue.

Dr. Louis Rassieur thought it very probably a sebaceous affair, or possibly an atheroma. The skin had grown to the bone, as not infrequently happened when one had gone through the periosteum in operations on the bone. He did not know what other condition of a benign nature could arise there. There was no glandular element there, except those of the skin. The tumor itself could be readily raised from the bone. It might be the result of an implantation of the skin thrust into the wound.

Dr. Ernest Saxl said that to him the whole appeared as a growth extending from the frontal sinus. The frontal sinus would

under certain conditions secrete a thick, glairy fluid. No aspiration syringe of any size would bring out a secretion of this character. He had seen two or three cases in which, as the result of a frontal involvement, the eye was pushed down and the lid increased to four times its size. By frontal involvement he meant an inflammation of the frontal sinus. When it became infected the frontal sinus secreted a thick, glairy secretion resembling egg albumin. Afterward, when it became softer, it might be seen coming out through the infundibulum or through a fistula. A fistula like that took eight or ten months to heal. After the cessation of pus formation there would be continued glairy secretion. The fluctuation here was imperfect, which was always the case in such a condition. If one filled a rubber bag tightly with egg albumin, the fluctuation would be less than if water had been used, because motion was not transmitted so quickly by the albumin as by water.

Dr. Muetze, in conclusion, said that the boy had been struck by a baseball on the right side of the nose last June. Soon after the eye began to water and there appeared a swelling. He had dissected out the sac until the posterior portion was reached, where it seemed attached to the bone and there it burst. He did not believe the present tumor communicated with the frontal sinus. The first one certainly did not. He intended removing it very soon and would report the result.

Demonstration of the Stereoscopic Scotoma Charts of Haitz.

By Dr. J. W. Charles. The stereoscope seems to overcome the difficulty we have all experienced in discovering beginning central scotomata. With the aid of the stereoscope it is very easy to determine whether the patient has a scotoma and to map it out. One simply places these charts in the focus of the lenses of the stereoscope and obtains central fixation of the eye to be examined. Even in ordinary cases of heterophoria the eye does not hesitate. It is ordinarily very difficult to obtain the necessary fixation for mapping of small scotomata.

DISCUSSION: Dr. Luedde stated that this test was so accurate that it had been claimed that it was possible to detect a scotoma for red after the patient had smoked a strong cigar.

JOHN GREEN, JR., Secretary.

MEETING OF OPHTHALMIC SECTION, ST. LOUIS MEDICAL SOCIETY.

January 8, 1908.

The Chairman, DR. BARCK, Presiding.

Remarks on Serpiginous Ulcer.

By Dr. A. Alt. The author reported on recent work done in the investigation of this subject. He drew attention to the fact that the Morax-Axenfeld bacillus is often the cause, although the diplococcus lanceolatus alone or accompanied by staphylococcus is found most often. A bacteriological examination should be made before any treatment is instituted, and if the Morax-Axenfeld bacillus is found zinc sulphate should be employed to cauterize the ulcer and the eye should be frequently bathed in a zinc sulphate solution. If the diplococcus is found, Roemer's serum seems to offer in many cases better results than the other forms of treatment hitherto employed.

DISCUSSION: Dr. Williamson was particularly interested in Dr. Alt's case for the reason that he had recently had a very unfortunate experience with a case of serpiginous ulcer, the patient being the father of a physician. The patient, 64 years old, had come to his office six weeks before, presenting a very virulent conjunctivitis. There was no involvement of the cornea. A smear showed a preponderance of pneumococci and some staphylococci. The ulcer was about the size of a pin head. Although it was cauterized thoroughly it continued to spread. In two or three days a second focus began to show distinct from the original ulcer. Ordinary treatment, lavage, hot applications, the use of atropine, etc., failed to have any effect and the ulcer continued to spread and a marked hyopyon appeared. The hyopyon was removed by Saemisch section and the patient was now practically blind from the resulting leucoma. Dr. Williamson believed this would have been an excellent case for serum treatment, certainly all other treatment employed, the use of idoform, cauterization, etc., had absolutely no effect in stopping the process. Such a result was very discouraging.

Dr. Meyer Wiener had recently had a case of serpiginous ulcer at the clinic of the Washington University Hospital which was very slightly developed when the patient arrived. It involved a semi-circle of about half the cornea. It continued to grow worse, and after four or five days the process stopped and the eye began to get

better. In a short time the ulcer was comparatively clean, but remained the same size and shape. This clean ulcer, with no discharge whatever, refused to heal, and it was several weeks before it showed any sign of beginning to fill up, like the malarial ulcers sometimes seen. But the eyeball began to shrink and finally when the ulcer did heal there was not much vision, with very little scar. The active process was stopped without any perforation and it had looked at that time as if the patient would get fair vision, but probably on account of the depth and size of the ulcer the nourishment was impaired.

Dr. Clarence Loeb, in regard to the treatment of corneal ulcers, called attention to an article in the July number of the *Annals of Ophthalmology*, in which the production of passive hyperemia was advocated. The writer reported twenty successful cases. In three he failed to effect a cure. He had found that the corneal scar was less dense and the vision much better than under any other form of treatment he had used.

Dr. Carl Berek said that he had just received the second report from the Heidelberg Society on this serum. The serum was now prepared from cultures of the pneumococcus and had proved successful in a certain number of cases. The clinical picture was changed entirely within a few days after the injection of the serum. The statement had been made that the serum would come into the market through the firm of Merck, about the first of this year, and every tube would be tested before leaving his laboratory by Dr. Roemer. It was certainly to be hoped that this serum would prove effective in cases like the ones reported, which were undoubtedly the most serious of all corneal affections.

JOHN GREEN, JR., Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY, PHILADELPHIA.

The regular meeting of the society was held at the hospital on Monday, March 2, 1908, at 3:30 p. m. Samuel D. Risley, M.D., chairman.

Dr. Goldberg, the pathologist, exhibited the specimens and presented a preliminary report of a loss of persistent vitreous artery in a globe in which Mutes' operation had been performed.

Dr. Wm. Campbell Posey exhibited a man 52 years of age from whom he had removed a carcinoma from the upper lid,

which was the size of a small lemon. The entire structure of the upper lid was infiltrated with the growth, and the outer half of the lower lid as well, requiring the complete removal of these tissues in the eradication of the growth by excision. The gap was filled with a large pedicled flap taken from the forehead. Union was prompt and the appearance of the parts two weeks after the operation was most satisfactory. Dr. Posey dwelt upon the necessity of bringing the flap into position and securing it with proper stitches as rapidly as possible, and said that he thought the complete control of all hemorrhages from the flap and surrounding tissues was unnecessary, the flap "taking" well, notwithstanding a considerable amount of free oozing. He dwelt upon the value of a 1 to 3,000 salve of bichloride of mercury and the application of firm and properly distributed pressure for some days after the operation.

Dr. Lentwager said he would cover the lower border of the flap with Thiersch grafts before turning it against the cornea and mucous membranes, and he would keep the edge free for sometime in order to prevent union of the two surfaces. He cited an instance of the removal of a large redent ulcer of the nose wherein this procedure was carried out with great benefit.

Dr. Conrad Bevens said that Thiersch grafts should be left undisturbed for several days. After 48 hours the application of heat may hasten the grafting process, yet it is unsafe to handle the parts until after 72 hours, when deforming sutures may be removed if necessary. He believes the parts will heal more rapidly and the formation of deep cicatrices be obviated by the application with gentle massage of emollient salves.

Dr. Harlan said Dr. Posey's case reminded him of one he had had many years ago in which he had made horizontal incisions and had been careful to obtain as broad a base for the flap as possible in order to insure a good blood supply to the parts.

Dr. Risley's experience with Thiersch grafts lead him to believe that the application of moist, hot dressings for forty-eight to seventy-two hours were not necessary. He employed only a piece of protective, covered by a pad of gauze which had been soaked in bichloride solution, this in turn being covered by a pad of dry cotton which was not removed for forty-eight hours, when the graft would be found a pinkish color and firmly adherent. He believed that if the graft were sufficiently thin and had not

been spoiled by the application of chemicals, that it was firmly fixed in a very few hours after its application.

In one case where the patient became violent with surgical delirium and rudely tore the dressings and partly displaced the graft within the first twenty-four hours, there was profuse bleeding, but the healthy cells replacing the epitheliomatous tissue, which had been scraped away, had become so firmly a part of the normal tissues that the case went on to recovery without incident. He firmly believed that in the case of the Thiersch graft, at least, prolonged treatment of hot stupes were not necessary. He did not know how far the same experience would hold in the case of Thiersch graft placed on the inner side of a skin flap, since he had had no experience in such a procedure, but was of the opinion that if not necessary for the life of the flap itself, it would not be required for the Thiersch graft.

DISCUSSION: Dr. Posey said that he had performed a number of blepharoplasties, in which the raw surface of the skin had been brought in contact with the globe but he had never seen harm follow. The epithelium forms rapidly, and a smooth surface is soon presented to the ocular tissues. He thought that a previous dissection of the flap would be unnecessary and was of the opinion that there would be considerable shrinkage if the flap was not united to some tissue.

Dr. P. N. K. Schwenk reported two cases of Traumatic Cataract, where each had lost the use of the left eye from injury; one 38 and the other 33 years ago, on which he had done a lens extraction and obtained nearly full vision in one and 6/9 in the other; who lately having lost the use of the right eye,—one from traumatism and the other by incipient cataract. From this he concludes that a retina which has once functionated will not lose that habit, even though deprived of its light stimulus for many years.

He also showed that, if an interval of three years or more elapses between two eyes becoming blind from cataract, that the axis of such eyes will assume a line parallel to the axis of orbit, and, therefore, you will have a heterophoria in all cases after bilateral lens extraction, requiring prisms in order to obtain single vision or comfortable binocular vision.

He concluded his paper, by stating, that if either of these patients were to present themselves to our clinics today, they would be advised to have eyes enucleated, fearing sympathetic ir-

ritation following the retention of such much injured members. He asks the question: "Have we become over-conservative?" These two cases had in reserve each one eye, which 38 and 33 years respectively after injury became as a "lamp to their feet" and enabled them to earn their own living, due to conservative (?) surgery in vogue forty years ago.

Dr. Risley congratulated Dr. Schwenck upon the results he had obtained and agreed with him that, often by patient and conservative surgery, we may save eyes which at first, because of the extensive wound and correlated conditions present, we had felt required their prompt enucleation.

Dr. Bevens cited instances of apparently hopeless eyes which were saved with useful sight by conservative measures and the use of mercury by innunction.

Dr. Samuel D. Risley presented the history of a patient now 15 years of age, born of syphilitic parents, who came under his care when eight months old, blind in both eyes from prenatal iritis. There were eight children, the subject of the sketch being the last. The first four were still-born between the fourth and seventh months of gestation. The family then came under the care of Dr. R. G. Curtin, who placed the mother on specific treatment, after the fifth conception. The child was carried to term, but was born with a skin eruption and died a few days after birth. Both parents were then placed under treatment, which was continued until after the sixth conception and until term by the mother, the product of which was a healthy child which died a few years later with diphtheria. The antisyphilitic treatment of the parents was continued and a seventh pregnancy resulted in a perfectly healthy female child, now a sprightly, healthy girl of 17 years of age. The parents, supposing themselves cured, then relinquished treatment and neglected the physician for a year or more. The eighth pregnancy occurred and the subject of Dr. Risley's sketch was born, a puny child with bad eyes, stuffed nostrils, and an eruption over the body and limbs. When Dr. Risley first saw the child the general syphilitic facies persisted, there was annular synechia in both eyes and a gray lymph mass occluded the right pupil. A mercurial bandage was prescribed and continuously worn for a year. The general condition improved, but the right eye developed a steadily increasing buphthalmos and at twenty months of age the left became glaucomatous, had recurring attacks of redness and pain (commencing buphthalmos). She was

then admitted to the Wills Hospital and an iridectomy performed on the left eye, under which the vision improved until the growing child could find her way about and finally learned her letters on large play-blocks. In 1899 the right, buphthalmic eye was removed and had an antero-posterior diameter of 36 mm. vision in the left eye was maintained for eight years, when she rapidly sank into a state of mental imbecility and the eye became blind to all but shadows.

Dr. Bevens complimented Dr. Risley on his success in shortening the extension of buphthalmos by iridectomy, and he told of a case in his own service in which, after ten years, good effects by this procedure had been obtained and the patient has with the aid of glasses a serviceable eye.

Dr. Harlan said he could not recall a case of prenatal iritis from his own experience, but he had had many cases of buphthalmos. He is inclined to believe with Abadie that severe choroiditis is associated with buphthalmos and that the cause of the buphthalmos lies in the disease of the uvea. Therefore the treatment of the condition must be directed towards curing the chorio-retinitis.

Dr. Risley believes prenatal iritis to be very rare, and he has for years conceived buphthalmos to be closely associated with disease of the choroid. He had in mind a colored boy whose buphthalmos had been relieved by broad iridectomy and in spite of very deep cupping of the disks the boy was leading an active life twelve years after the operations were performed.

Dr. Radcliffe presented a case of foreign body in the lens not located by x-ray—with a foreign body in fellow eye. The patient, a machine driller, was struck in the left eye by a piece of steel three years ago, followed by cataract. Vision began to fail in right eye one month before presenting himself at the hospital. No history of injury—no pain in either eye. Vision in each eye equal fingers at three feet. On ophthalmoscopic examination a minute foreign body was apparently found embedded in the lens on the equator and to the nasal side of the center, but x-ray failed to verify the clinical diagnosis. A foreign body (2 mm. x 4 mm.) was located in the left eye; 15 mm. back—11 mm. down, and 2 mm. to nasal side. The right lens was curretted, and a foreign body (1½ mm. x ½ mm. and very thin) was found. The failure to locate it by the x-ray was probably due to the thin edge of the chip presenting to the tube, and consequently

casting a lighter shadow than the temporal side of the orbit. The vision of the right eye with correcting lenses is 20/30 and J. No. 1.

No attempt has been made to remove foreign body from left eye, as it is probably encysted. The lens has been curretted, and capsulotomy will be done later.

Dr. Posey said that Dr. Radcliffe's case illustrated the value of x-raying many eyes with symptoms which might have been occasioned by the lodgement of a foreign body in the eye, but in which no history of a foreign body having entered the eye was obtainable. In several cataractous eyes, without history of traumatism, the x-rays had discovered the cause of the lenticular opacity, history and marks of external injury to the eye being absent.

Dr. Schwenk recalled the case of a man who, 18 years after an injury, refused to follow the advice of two surgeons of the hospital and have the eye enucleated, in whom it was discovered later that the lens had been destroyed by the foreign body, while the body had become encysted behind the iris so that what appeared to have been the crystalline was really the foreign mass.

Dr. Risley cited a case of an enucleation of a leukomatous eye in which there was no history of injury, nor had a foreign body been seen in the fundus, yet when section was made a foreign body was found lodged on the optic disk.

Dr. Bevens said he had always been struck by the singular fatality that sometimes followed on the smallest injuries, and the all but marvelous vitality demonstrated after great injuries. He has had to remove eyes shortly after they have been treated for lodgment of small bodies on the cornea, so rapidly has infection progressed. While he recalled an instance where good vision was obtained after a large piece of metal had penetrated and been retained; but later on sympathetic trouble set in and at the enucleation a large piece of metal was found at the chiasm. Another instance showing a patient's ignorance of his condition was where a beard of wheat had penetrated the cornea and lodged in the lens.

Dr. Harlan told of a case of traumatic cataract which later subsided, when it was noticed that the vision of the fellow eye had become lowered by active optic neuritis. The eyeball was enucleated and there was found in the posterior part of the globe, and extending into the nerve, a piece of metal a half inch long.

Dr. Risley said that tolerance of the eye to the presence of a foreign body in the vitreous chamber depended largely upon two factors. First, the nature of the substance; second, its

anatomic location. Glass, for example, may be contained in the eye with relative impunity, except when it rests in the ciliary region. While zinc, copper, and lead are sooner or later fatal to the globe.

Dr. Radcliffe was puzzled in his case to know how the globe could have been penetrated without the man's knowledge.

Dr. Risley told of a man whose eye had been penetrated by a sliver of glaze which had been split from a brick by a shot from a rifle. The patient was not greatly annoyed, and when the aqueous became clear again there was discovered only after the greatest minuteness in examination a fine puckering of the iris opposite a faint linear scar in the cornea, and after mydriasis a schist-like opacity was seen in the nasal periphery of the lens. After ten years' close observation, the eye had maintained quiet.

Dr. Schwenk now has in the ward a man who stoutly maintained that no body had entered his eye, yet a large, irregular piece of metal was removed from it.

The next meeting of the society will be held at the hospital on Tuesday, April 7, at 3:30 p. m.

BURTON CHANCE, Secretary.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

The Massachusetts Optometry bill has the unanimous opposition of the Massachusetts Medical Society, and the Boston Homeopathic Society. It has been suggested that there is no reason for a separate board of examiners. The whole affair should be managed by the State Board of Medical Examiners.

Dr. Frank Allport of Chicago visited Sioux City recently and while there delivered an address upon "The Responsibility of the School to the Physical Child, with Especial Reference to the Examination of Eyes and Ears." That this subject was a live one in Sioux City was attested by the attendance of all those interested in education. A half-holiday was granted so that teachers and pupils alike might hear the lecture.

The Illinois schools for the blind and deaf at Jacksonville, Ill., have received their share of criticism in the recent investigations of state institutions. Flagrant violations of sanitary laws were found, one result of which has been an epidemic of diphtheria, which caused the death of at least one child in the town outside of the institution and resulted in a strict quarantine.

The New York Association for the Blind.—In New York there are 6,000 blind persons, three-fourths of whom became blind after the school age, so that the state is not bound to instruct them. These are the people whose needs brought about the formation of the New York Association for the Blind. The work of the association includes a department for the distribution of literature on the prevention of infantile blindness, a registration bureau which serves to bring the association into touch with all the blind of their state. Catalogues are published containing particulars of all institutions and associations for the blind, showing their needs; a reference library on subjects of particular interest to them; two ticket bureaus are maintained supplying tickets to musical and dramatic performances to those blind who cannot afford them. There is a workshop for blind men at 147 East Forty-second street, where broom-making and chair-caning are taught and raw materials are now given to blind women in their homes and they are taught to make various marketable articles which are sold for them by the association. Later it is hoped that a shop may be opened for them. The association employs six blind and two sighted teachers, who visit the blind in their homes and teach them reading, writing, singing, typewriting, telephone switchboard operating, sewing by machine and hand, knitting, crocheting, basket and lace-making and bead work. The association is greatly in need of financial aid, as it must grow and expand. Even now it is a shining example for other states to follow. Among its well-known supporters are Dr. Lyman Abbott, Samuel L. Clemens (Mark Twain), Jos. H. Choate, Grover Cleveland, Helen Keller and Carl Schurz. Dr. F. Park Lewis of Buffalo is one of the vice-presidents, and Dr. Arnold Knapp of New York is on the advisory board of the association. Other prominent ophthalmologists who have aided the association in compiling their instruction for preventing blindness and on the hygiene of the eyes, are Prof. Fuchs of Vienna, Prof. Dr. Axenfeld, Frieberg i. B., Germany, and Dr. John A. Tenney, of Boston. A journal called the "Outlook for the Blind" is published by the Massachusetts Association for Promoting the Interests of the Blind. The yearly subscription price is only 50 cents and it is published quarterly by Chas. F. F. Campbell, 277 Harvard street, Cambridge, Mass. This journal consists of essays and reports upon the work being done for the blind everywhere. It is to be especially commended for the clean, wholesome character of its advertising.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|--|---|---|---|--|
| 9 A.M. | Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.G.) G. W. Mahoney (Poli.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wippert (E. E. N. T.) | A. G. Wippert (E. E. N. T.) | A. G. Wippert (E. E. N. T.) | | A. G. Wippert (E. E. N. T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E. E. N. T.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) D. A. Payne (E. E. N. T.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) Wm. A. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) F. K. Findlay (Inf.) Wm. E. Gamble (Inf.) Wm. F. Gamble (Inf.) D. A. Payne (E. E. N. T.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) H. W. Wilder (Rush) N. A. Young (Inf.) Wm. E. Gamble (Inf.) E. J. Gardner (E. E. N. T.) C. G. Darling (N.W.U.) Paul Guilford (St. Luke's) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) T. A. Woodruff (St. Luke's) | E. V. L. Brown (Inf.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) E. J. Gardner (E. E. N. T.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) F. B. Loring (P. & S.) E. K. Findlay (P. & S.) Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) M. H. Levensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) E. J. Gardner (E. E. N. T.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) F. B. Loring (P. & S.) E. K. Findlay (P. & S.) Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) W. A. Fisher (E. E. N. T.) Wm. F. Gamble (Inf.) J. B. Loring (Inf.) D. A. Payne (Hls. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) H. B. Williams (Inf.) E. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (N.W.U.) Richard Tivenen (N.W.U.) M. H. Levensohn (P. & S.) S. L. McCreight (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) Wm. E. Gamble (P. & S.) | H. H. Brown (Hls. Med.) | J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) Wm. E. Gamble (P. & S.) | Burton Hazeltine (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.G.) |
| 4 P.M. | W. F. Coleman (P.G.) | C. W. Hawley (P.G.) | G. F. Suker (P.G.) | C. W. Hawley (P.G.) | W. F. Coleman (P.G.) | Brown Pusey (County) |

*Special operative eye clinics.

C. C. S.: Chicago Clinical School,
19 W. Harrison Street.
E. E. N. T.: Chicago Eye, Ear, Nose
and Throat College, Washington and
Franklin Streets.

ABBREVIATIONS:

County: Cook County Hospital, W.
Harrison and Monroe Streets.
Hls. Med.: Illinois Medical College,
182 Washington Blvd.
Inf.: Illinois Charitable Eye and Ear
Infirmary, Peoria and Adams Streets.

Poli.: Chicago Policlinic and Hospi-
tal, 174 E. Chicago Avenue.
P.G.: Post Graduate Medical School
of Chicago, 2400 Dearborn Street.
N. W. U.: Northwestern University,
2131 Dearborn Street.

Rush: Rush Medical College, W.
Harrison and Wood Streets.
St. Luke's: St. Luke's Hospital, 1416
Indiana Avenue.

THE OPHTHALMIC RECORD

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OF OPHTHALMOLOGY

VOL. XVII

CHICAGO, JUNE, 1908

NO. 6, NEW SERIES

BULLET WOUNDS OF THE ORBIT AND ITS SURROUND- ING PARTS.

BY EDWARD R. WILLIAMS, M. D.,

BOSTON.

(Illustrated.)

Bullet wounds in the orbit cause both transient and permanent changes in the eye-ball. Among the former the ophthalmoscopic alterations are classed as contusion injuries in which the globe is not necessarily touched by the missile. Permanent injury to the eye-ball, on the other hand, is almost always due to direct contact of the bullet with the globe itself or with the optic nerve. Additional interest in this series of cases occurring in civil life comes in comparing it with similar accidents received in time of war. In a recent article von Merz¹ of St. Petersburg gives a good classification of bullet wounds of the eyes and their surrounding parts. The patients were seen by him during the late Russo-Japanese war. The following ten cases have been arranged in the same manner. Eight of these cases were treated at the Boston City Hospital, one was a private patient and the tenth was seen in a foreign clinic.

Three cases of wounding of both eyes followed by complete blindness:

CASE 4. A German man, aged 45 years, was brought to the Boston City Hospital on May 2, 1906, on account of a self-inflicted wound of the right temple. At the first examination the patient was semi-conscious and suffering from shock. V. R.= counts fingers at one foot. V. L.=0. Exophthalmos of both eyes. May 4 the X-ray examination showed the course of the bullet approximately as follows: It entered 2 cm. back of external Canthus, in passing through the right orbit it injured the optic nerve. Part of the bullet was seen lying in the ethmoid cells, and the rest passed under the left eye and was imbedded between the globe and the lower lid. The left cornea became dry from exposure to the air in spite of all efforts to reduce the

¹ Schussverletzungen des Auges. Beilageheft, Klin. Monatsbl. F. Augenheilkunde, 1907.

exophthalmus and cover the globe with the lids. Finally corneal ulceration supervened and, as the eye was sightless, an enucleation was performed. As soon as a free canthotomy was done to relieve the pressure on the lids and globe, the larger part of the bullet was recovered from the position where we expected to find it, *i. e.*, beneath the lower lid at the outer canthus. Upon removing the globe a hole large enough to admit the index finger was felt, leading into the ethmoid cells. This allowed free drainage from that region. In spite of this free opening sepsis of the ethmoid cells threatened three days after the operation. The temperature rose to 102.2° , and Dr. Monks was called in consultation, but no change in the treatment was advised. The first fundus examination of the right eye was made nineteen days after the injury. There was optic neuritis, which was subsiding. Already signs of atrophy of the nerve were visible. The mental symptoms were very interesting during the early part of the time in the hospital. At first he was fearfully depressed and showed decided suicidal tendencies again. On this account he required close watching. This condition passed into delirium after the operation. He was noisy and quite unruly, reaching a climax three days after the operation. Nine days after the operation the temperature was again 99° . The discharge from the entrance wound as well as that from the ethmoid cells ceased after four weeks, at the time of his discharge. The final examination of the right eye in the Out Patient Department showed a gradual change to complete atrophy of the optic nerve.

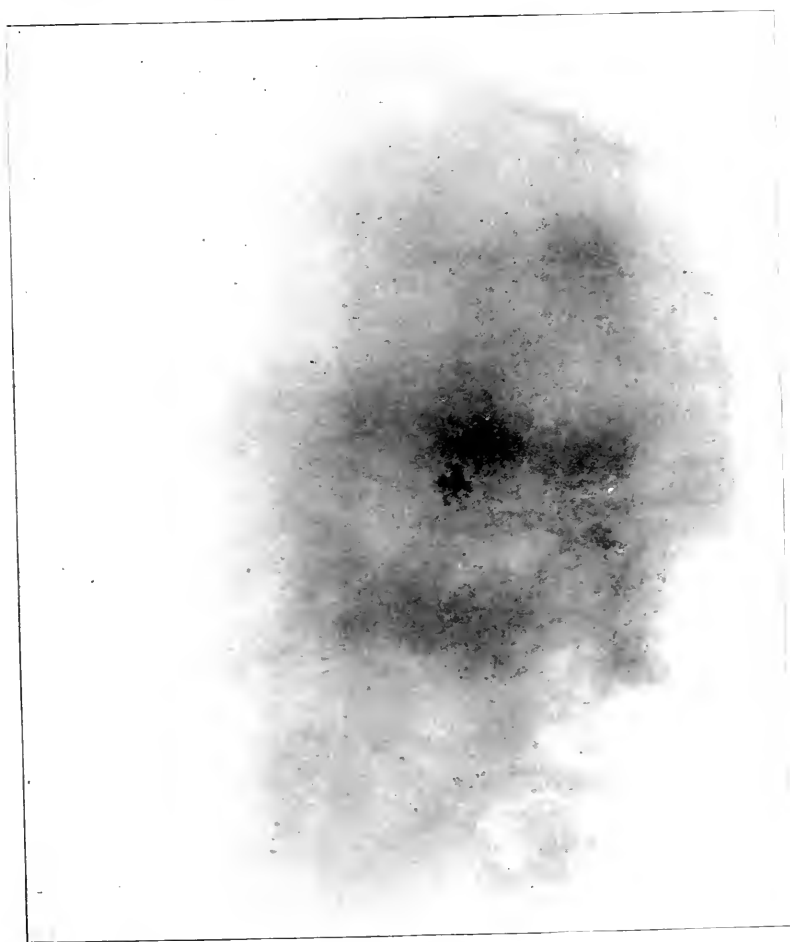
CASE 9. Man, 30 years old, was admitted to the Boston City Hospital on May 11, 1907, on account of self-inflicted wound of the right temple. The bullet passed behind the right globe, through the nasal region, penetrated and completely destroyed the left eyeball. The right optic nerve was either cut through or badly lacerated and the vision was abolished. The fundus showed complete atrophy of the optic nerve, fresh hemorrhages, exudation and heaps of pigment scattered all over the retina, but most numerous in the macula. The patient's general condition was excellent and he had no cerebral symptoms.

CASE 10. This man was seen in a foreign clinic. Little of the clinical history was recorded, most of my notes giving merely the end results. Two months previous he shot himself in the right temple, the bullet passing behind both eye-balls and lodging under the skin of the left temple. The vision in each eye was abolished. The right fundus showed a broad white band extending from the optic nerve toward the nasal periphery. Above and below this

streak, which was the white sclera showing through the destroyed retina and choroid, were many hemorrhages. Some blood, attached to the retina by pedicles, swung free in the vitreous in addition to numerous other floating opacities. This appearance was due to the bullet scraping the back of the right globe. Exactly what had occurred to the posterior portion of the left globe it was impossible to say. The vitreous was too cloudy to allow a view of the retina. Judging from the course of the bullet the left eye-ball had suffered the same amount as the right.

One case where one eye was penetrated by the missile and followed by complete blindness of the injured eye. The second eye remained intact:

CASE 1. An Italian man, 24 years old, was admitted to the



Boston City Hospital on July 10, 1907, on account of a self-inflicted wound of the left temple. He was first treated at the Relief Station, where the left eye-ball was found perforated by the bullet and it was at once removed. The bullet had entered the left temple about two inches behind the external angular process of the frontal bone, penetrated the left eye, passed beneath the right orbit and emerged through the malar bone beneath the middle of the right orbit. First examination of the eyes was made July 21 in the ward before the patient's discharge. Diagnosis, very slight but general haze of the retina.

July 24. After the discharge to the Out Patient Department an examination of his eyes revealed the following conditions: V. R.= 20/70, not improved with glasses. There was a very minute retinal hemorrhage bordering the inferior branch of the retinal artery. In addition a very shadowy and indistinct area of retinal oedema was situated below the disc and extended towards the macula. In the macula there was a sharply defined oval area, one-half disc-diameter long, which may have been also a hemorrhage.

August 2. V. R.= 20/50. The small hemorrhage below the disc as well as the oedema had disappeared. The patient was not seen again.

Four cases of non-penetrating wound of one eye followed by more or less complete blindness of that eye. The second eye remained intact:

CASE 5. Boy, eight years old, was brought to the Boston City Hospital on August 13, 1906, in a state of collapse caused by a bullet wound of right orbit. His assailant stood about two feet away and discharged a .22-calibre revolver into the patient's face. At the first examination the patient was semi-conscious and would answer questions. V. R.= 0. V. L. not affected. As a result of a consultation with Dr. Cotton it seemed best to keep the boy absolutely quiet, and, if a clot was causing compression, not to raise the blood pressure by further stimulation with strychnia. The patient nearly died during the night but the next morning he was decidedly better and thereafter the improvement was steady. X-ray examination showed the bullet having entered the inner and upper quadrant of the orbit through the upper lid, apparently had passed down and outward through the apex of the orbit, and was lying apparently under the right front lobe on a line with the ears. There were no late cerebral symptoms and twenty-five days after the accident the boy was discharged. The fundus of both eyes was examined twice. In the right was seen optic neuritis and extensive

chorio-retinitis. Later the atrophy of the optic nerve was complete which, together with a thorough disorganization of the retina, caused total blindness.

CASE 6. Young woman, 23 years old, was brought to the Boston City Hospital August 15, 1904. She had been shot twice, one bullet grazing the abdomen, the second passing through the left orbit. When first examined the V. R. was not affected, V. L.=0. I saw the patient three days after the accident, and found the following condition of her eyes: There was considerable exophthalmos, increasing later to 3 mm., so that the movements of the globe were limited. The right fundus was normal, the left showed choked-disc with retinal hemorrhages. The bullet entered the left temple in front of the zygoma, had passed beneath the left eyeball. It continued through the inner and lower quadrant of the left orbit, then into the ethmoidal region and emerged from the right eyebrow exactly over the middle of that orbit. Five days later the left fundus showed that the choked-disc was subsiding, but some of the retinal hemorrhage persisted. V. L.=counting fingers at two feet.

September 2. An examination at my office showed a slight improvement in the condition of the left eye. V. L.=1/50. The fundus showed a commencing atrophy of the optic nerve and retina. Later the atrophic condition of the retina, especially in the macular region, became more marked and the last test of vision, on April 26, 1905, was 1/30.

The bullet had caused many adhesions in the left orbit. The action of the internal rectus was restricted so that there was a divergent strabismus. This was operated upon in September, 1905, and although the muscle belly was bound down still the strabismus was corrected.

CASE 7. An Italian man, 22 years old, was wounded by small 1/16 inch shot in the forehead and chest. The man walked into the hospital on May 21, 1906, the day after the accident. When his assailant fired the shotgun he was standing about 10 feet away and fortunately the patient was leaning over at the moment. Most of the shot caused superficial skin and scalp wounds. X-ray examination showed that one shot had penetrated the frontal bone just above the supra-orbital ridge, apparently had passed through the frontal sinus and the inner side of the orbit, where it scraped the nasal side of the globe. The shot was located in the malar bone close to the skin. No shot were found in the left orbit or in the left eyeball. The house officer was unable to say at the

first examination whether the eyeball had been perforated, because the conjunctiva was swollen with oedema and blood. V. L.=0. V. R. not affected. The lens was dislocated forward and the intra-ocular hemorrhage prevented a view of the fundus. There were no symptoms of shock besides slight drowsiness, and during the five days in the hospital his general condition was excellent. Before his discharge it was possible to see some vessels in the retina as the hemorrhage was gradually absorbing. The vision was not improved, which indicated that either the retina or the optic nerve were also injured. The patient was not seen later in the Out Patient Department.

CASE 8. Man, 38 years old, was brought to the Boston City Hospital on June 15, 1905, on account of a self-inflicted wound of the left temple. The bullet had entered 3 cm. posterior to the external angular process of the frontal bone, passed above the globe and was lodged somewhere in the nasal region. The wound was enlarged, at the first examination, to control the hemorrhage from the anterior branch of the middle meningeal artery. Exophthalmos of the left eye equaled 3 mm. There was a paralysis of the left superior levator, exterior and superior recti. V. L.=0. V. R. not affected. Three days later a fundus examination was made. The right was normal, the left showed a choked disc and a hazy vitreous. The bullet had not scraped the side of the globe, causing lesions of the retina. This man was not seen later.

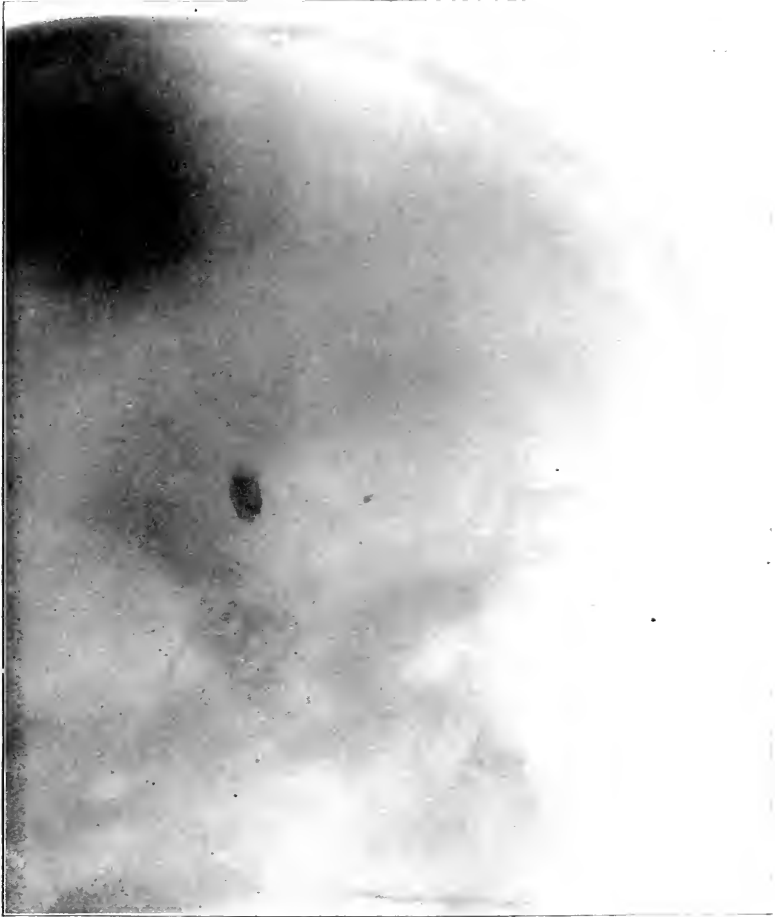
Two cases of injury to one eye, causing only temporary blindness:

CASE 2. A fifteen-year-old Italian girl was treated at the Surgical Out Patient Department of the Boston City Hospital on June 17, 1905. The patient suffered merely from slight symptoms of concussion at the time of the accident. The girl was shot while looking out of a window, her assailant standing below her on the street. The bullet grazed the left ala nasae, burrowed 3 cm. through the skin of the left cheek at the outer angle of the orbit, and emerged over the left temple. No fracture of the malar bone was found.

June 21. The patient was referred to the Eye Department of the Out Patient Service. V. R. 20/20. V. L. = 20/20. Slight ciliary injection of the left eye, which she said was subsiding; no pain or tenderness. The superficial skin wounds were healing per primam. The pupils were equal and reacted to light. The right fundus was normal. The left, after careful examina-

tion with the upright image, showed a very slight but general retinal haze. Diagnosis: Traumatic retinitis.

June 23. V. L.=20/40. No apparent trace of the retinal haze.



June 26. V. L.=20/20. The fundus is absolutely normal again. The ciliary injection has gone also.

CASE 3. Boy, aged about nine years, was brought to the accident room of the Boston City Hospital on May 16, 1906. He was suffering moderate pain in the right eye and had symptoms of slight shock. While looking into the muzzle end his revolver exploded and the bullet entered the right orbit. V. R.=counts fingers easily at one foot. V. L. not affected.

May 17. X-ray examination located the bullet about as follows: The missile entered 4 mm. below the right internal canthus, passed through the floor of the orbit and was imbedded between the right tonsil and the angle of the jaw. Consultation with Dr. Monks, who advised leaving the bullet alone unless further symptoms arose. The temperature arose yesterday afternoon to 105° , but today is 101° .

May 19. The patient is comfortable and no mental symptoms. The first signs of shock have already passed.

May 21. The fundus examined. The right showed a traumatic neuro-retinitis. The edges of the disc are quite indistinct, slight congestion of the veins, small retinal hemorrhages between macula and the disc and above the disc. V. R.=20/100. The left



fundus is normal. The general condition steadily improving.

May 25. There is a general subsidence of the retinal inflammation, but the hemorrhages are quite numerous. V. R.=20/70.

May 29. Discharged to the Out Patient Department. No further notes made of the condition of the eyes.

The ocular lesions and their treatment will be first considered according to the above classification of von Merz.

1. The three cases of wounding of both eyes followed by completed blindness. Nothing could be done to prevent the final complete blindness. In Cases 9 and 10 one eye was destroyed by the penetrating bullet. In the second eye the optic nerve was cut through or badly lacerated. In Case 4 the left eye was blind before corneal ulceration made its removal necessary. The right optic nerve in this instance was so badly lacerated that the sight was retained a few days only.

2. The one case of penetrating wound of one eye followed by complete blindness, the second eye remaining intact. The left globe, the one nearest the wound of entrance, was completely demolished by the missile. Nothing remained to do but to remove the eye at once.

3. The four cases of non-penetrating wounds of one eye followed by more or less complete blindness of that eye. In Cases 5 and 8 blindness was mostly due to a laceration or squeezing of the optic nerve, causing atrophy. However, according to several authorities, the loss of sight accompanying choked-disc may be only a temporary condition. For instance, if Case 8 had been seen several weeks after the accident it is very possible that the vision of the left eye would have been improved. Case 6 had V. L. = $1/30$ nine months after the injury. In this instance the poor vision was mostly due to atrophy of the retina. However, there was also partial atrophy of the optic nerve. In Case 7 the loss of sight was at first apparently caused by the great intra-ocular hemorrhage. As this had begun to absorb before his discharge without any corresponding improvement in the vision it was presumed that some lesion of the retina or optic nerve had also occurred. In this group atropine was used to control congestion and help allay the traumatic inflammation. As soon as it was possible to make an ophthalmoscopic examination, in Cases 5 and 6 especially, it was seen that nothing could be done to prevent the inevitable atrophy which would follow the inflammation.

4. The two cases of wounding of one eye, causing only temporary blindness. Case 2 was simple oedema of the retina, the condition found in many cases of contusion of the eyeball. The oedema usually clears up, leaving the vision unaffected. In Case 3 there were more serious concussion lesions. The hemorrhages began to absorb rapidly, with a corresponding improvement in the sight. The routine treatment for these cases is to first use atropine, and secondly to give potassium iodide when we wish to help absorb retinal hemorrhages.

In considering the surgical symptoms the ten cases will be divided into two groups: A, where the bullet remained imbedded in the skull; B, in which the missile was known to have passed through the skull. Each group will be arranged in the following order:

1. Shock and Mental Symptoms.
2. Suppuration and Drainage. Penetration of Bullet.
3. X-ray Examinations.

A. The treatment of the five cases where the bullet remained imbedded in the skull was conservative. Shock, the first symptom to receive attention, was present in varying degrees. Case 4 suffered from profound shock, aggravated at first by melancholia. Later post-operative delirium, accompanied the threatened sepsis, so that, considering all the conditions, we hardly expected him to pass the crisis. Case 5, suffering also from such profound shock, required careful watching during the first week. Complete rest in bed was essential, because we believed a clot had formed about the bullet lying beneath the frontal lobe. This boy rallied very quickly as the mental symptoms subsided, considering how nearly fatal was the accident. Case 3, although seen almost immediately after the injury, showed remarkably few symptoms of shock. After three days mental symptoms had disappeared. Absence of cerebral symptoms in Case 7 was even more marked than the above, and may have been due to his having been hit by small shot.

Wound suppuration occurred in Case 4 and lasted four weeks. A small wick was used for a few days in Cases 3 and 5, but the discharge was scanty.

It is interesting to note how comparatively slight is the penetrating power of these small bullets, .22-.32 calibre. The course of the missile was often deflected when it met hard bone. Naturally its course was more easily observed in the second group, when the bullet had emerged from the skull. The destructive effect of the small, light bullet is increased in every one of these cases by the close range.

X-ray examinations were made in four of these cases. In Case 1 it was especially instructive, because part of the bullet was left behind in the ethmoid cells.

B. Finally we shall consider the four cases where the bullet passed through the skull. Case 2 can hardly be classed among these, as the bullet merely passed through the skin of the cheek. The mental symptoms consisted of very slight concussion, and she was treated as an out-patient. Cases 1 and 6 were transferred to

my service respectively eleven and three days after the accident, so that no note was kept of the earlier mental condition. In Case 9 the slight symptoms of shock and mental depression had disappeared after two days.

In all these cases there was little tendency to suppurate, the wound being aseptic the healing was rapid. Case 1 healed in fourteen days and the others in less time.

X-ray examination was not deemed necessary in any of these cases.

REPORT OF TWO CASES OF PALSY OF EXTRAOCULAR MUSCLES IN GRAVES' DISEASE.

By DR. WM. CAMPBELL POSEY.

PHILADELPHIA, PA.

CASE I. A. S., female, æt. 42 years, came to the writer's service at the Wills Eye Hospital in February of this year, upon account of failing sight and double vision, which had been slowly progressing for about a year. The patient had been nervous and excitable for several years but otherwise her health had been good. She had never had any prolonged illness, nor had she been subjected to any great mental or physical strain. She had had but one child, which is living and well at six years of age. The family history showed no neuropathic or other tendency to systemic disease.

Both eyes were pronouncedly staring, this being occasioned not by exophthalmus, which was absent, but by the wide dilation of the palpebral fissures. Graefe's, Stellwag's and Möbius' signs, were all present. There was a palsy of the right superior rectus muscle. The eyes were small, and when rotated strongly inwards, the vessels at the equator of the globe were seen to be much distended. The right pupil was somewhat the larger, but both irides responded normally to light and convergence stimuli. Both fundi were healthy, the nerves being of good tint. H. equaled $1\frac{1}{2}$ D. in the right eye and 1 D. in the left. Vision in the right eye equaled $\frac{5}{6}$, that in the left $\frac{5}{7}\frac{1}{2}$. The fields of vision in both eyes were somewhat contracted, but without reversal of the colors. The thyroid gland was distinctly enlarged, especially upon the right side. There was cardiac hypertrophy and a systolic murmur, which could be heard over the base and was transmitted into the vessels of the neck. The pulse was rapid, 124; perspiration was free. A diagnosis of Graves' Disease with palsy of the right superior rectus muscle was made and the case referred to Dr. Spil-

ler for further examination. Dr. Spiller concurred in the diagnosis and noted tremor of the hands and some exaggeration of the biceps and patellar tendon reflexes. Rest in bed, with proper hygienic and medicinal care were advised, but the patient was unwilling to submit to treatment.

CASE II. Miss M. C., aet. 63, single, consulted the writer May 17, 1905, on account of restriction in the upward and inward motion of the left eye, which had been present for at least a year. Headaches were complained of after close work and the eyes were sensitive to light and watery. It was elicited that the patient had been in poor health since 1880, but that notwithstanding this she had successfully performed during many years the arduous duties of missionary in Brazil. In addition to being generally nervous for a very long time, she had had frequent attacks of cardiac palpitation. Both tear ducts had been slit by a Brazilian oculist without giving relief to the epiphora.

Examination showed a slight degree of exophthalmus in both eyes, with pronounced Dalrymple sign. The Graefe sign, also, could be demonstrated at times. The excursions of the eyes were limited, this being occasioned by paresis of both external recti and of the left superior rectus and inferior oblique muscles. The right pupil was 3 mm. in size, the left 4 mm.; both irides responded well to light and accommodation stimuli. After the correction of a moderate amount of farsighted astigmatism, vision was brought to normal in each eye. The fields for form and color were normal. Dr. J. K. Mitchell, who had the patient in charge in the Presbyterian Hospital, reported slight involvement of the thyroid, but no murmur. There was a persistently rapid heart, but muscular tremor was wanting.

As stated by the writer in a paper upon the subject which he read before this Section 4 years ago,* palsies of the extraocular muscles in exophthalmic goitre are not extremely rare and are to be regarded not as accidental but rather as a part of the morbid process of Graves' Disease.

Interesting monographs by Ballet, Liebreicht, Baschian, Mannheim and Möbius were referred to and the writer said that it would appear from the cases reported and cited by these authors, that the paralysis may affect a single muscle or group of muscles of one eye, or even all the extrinsic muscles of one eye, and that occasionally one or more muscles of both eyes may be simultaneously affected. After analyzing all the reported cases, the writer concluded that

*The *American Journal of the Medical Sciences*, July 1904.

the palsies were of central origin, originating in the nerve nuclei, and pointed out that this observation is of interest as affording additional proof of the central origin of Graves' Disease.

TOXIC SYMPTOMS FOLLOWING THE INSTILLATION OF HOMATROPIN HYDROBROMATE.

CHARLES LEFEVRE, M. D.,

PHILADELPHIA.

I am induced to report this single case because of my belief that there is a very general impression that homatropin and its salts are practically free from toxicity when used in proper strength for ocular instillation. On referring to prominent text-books I find no mention made of even such a possibility, and I have read few reports of such happenings. Such a disagreeable and unfortunate experience serves to emphasize the value of the routine practice of making digital pressure over the inner canthi after ocular instillation of poisonous drugs. In view of the fact that homatropin hydrobromate is used so frequently, often in strong solutions, and in sensitive neurotic individuals, I think it remarkable that we hear of so few instances of systemic effects. I have used hyoscin hydrobromate, and scopolamin hydrobromate in 1-10% solutions far more frequently in refraction, and beyond occasional pharyngeal dryness have never noticed an untoward symptom. I mention this on account of having frequently read the warning that these two drugs are dangerous.

My patient was a married woman aged 35 years. She was apparently in good health, but I learned later that she possessed an unstable nervous system, which was a family characteristic. As she lived eighteen miles in the country, and could only devote a part of one day to refraction, homatropin was decided upon as a cycloplegic. The solution used was purchased by the writer, and was compounded by a careful pharmacist, who was positive that no mistake had been made. Merck's product was used. The proportions were: Homatropin hydrobromate, gr. $\frac{1}{2}$; Aq. Dest. M. xxiv. One drop was instilled into each eye at 12 o'clock noon, and she was told to return at 2 p. m. At this time the instillation was repeated, followed by two more at ten minute intervals.

Within a half-hour she complained of feeling "light-headed," and of a dry sensation in her throat. In less than ten minutes from this time her voice became thick and her statements were irrational. Hallucination of sight, and apparently hearing, were present. Muscular prostration and inco-ordination were pro-

nounced, she not being able to stand alone and grasp an object with any certainty. The face was slightly flushed and the pulse, while somewhat accelerated at first, became slow and moderately full within an hour. Vomiting occurred during the second hour, but the cause was uncertain, as goodly doses of aromatic spirit of ammonia had been given. At 6 p. m. some improvement was noted and she was removed in a cab to the house of a relative. A rational state of mind and a practical recovery of other functions was attained at about 9 p. m. At no time during the afternoon was drowsiness noted. Mild excitement was the rule. She was able to be driven eighteen miles to her home on the following morning, and suffered no further ill effects from the drug.

BLINDNESS FOLLOWING THE INJECTION OF PROTARGOL IN LACHRYMAL SAC.

F. PARK LEWIS, M. D.

BUFFALO, N. Y.

While the condition about to be described is exceedingly unusual, the possible danger which may follow an injection in the lachrymal sac should not be overlooked, and for that reason this case is reported.

The patient, a woman of fifty, stout, having flabby tissues and not a high degree of physical resistance, had suffered for some years from dacryocystitis. When she was first seen by the writer, the tissues around the eye were greatly swollen—an abscess had broken on the face and a fistulous opening yet remained through which pus discharged from the sac. Under the usual treatment the swelling decreased so that within a week or ten days probing could be successfully accomplished. The sac, however, continued to discharge freely and it was washed out with a twenty-five per cent solution of protargol. No reaction followed and the second day the same procedure was followed. About one c.c. of the solution was employed, when it was noticed that the swelling, which had not wholly disappeared, had slightly increased. As there was no discomfort, however, the patient was allowed to return to her home thirty miles distant. The second day after, word was received by telephone that great pain had developed shortly after her leaving the office, that it had not then disappeared, and that the eye had become blind.

The patient was directed to return to the city immediately when it was found that there was slight proptosis, a moderate degree of swelling of the orbital cellular tissues, soreness and

pain with difficulty in moving the eye. The pupil was dilated and immobile. There was no light perception. The retinal vessels were slightly congested and the disc markedly reddened.

It was evident that the ruptured sac had allowed a percolation of the protargol into the orbital tissues, intensifying a cellulitis which already existed and involving the optic nerve, either by extension of the inflammation or by constriction from pressure. Gradually the soreness and swelling disappeared, when the papillitis gave place to atrophy. While the tissues were still somewhat swollen Dr. A. A. Hubbell of Buffalo and Professor O. Haab of Zurich, who was visiting this country as the guest of the American Medical Association and who happened to be in the city, called upon the writer when the patient was shown to them. To each of them the experience was unique. On Professor Haab's suggestion a free incision was made with a Graefe knife deep into the orbit under the eyeball with the hope of allowing any fluid that might have accumulated to escape. None came away, however. The inflammatory symptoms gradually disappeared but leaving the eye perfectly blind. Five years after the accident the optic disc is still blanched and light perception is absent. The eye in every other respect is normal.

The case is reported for the purpose of illustrating the possible danger of strong or irritating injections in a sac in which a rupture allows a possible involvement of orbital tissues and the necessity of exercising extraordinary care under such circumstances.

AN IMPROVED INSTRUMENT TO SHORTEN THE SUBJECTIVE BRANCH OF REFRACTION.

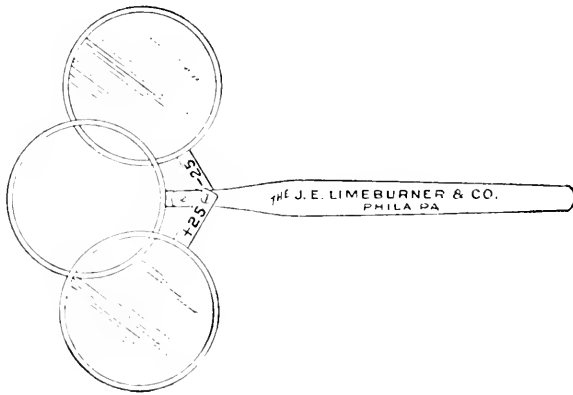
In carrying out my system of *first, second, third*, as published in your August journal of 1905, I soon discovered that two soiled neutralized lenses were not equal to none. This fact can be easily demonstrated by placing a soiled or even a clean *plano* before a corrected or nearly corrected eye and asking which is better, "off or on," or you can demonstrate it equally well upon your own eye.

A few weeks after the 1905 publication, I had the instrument made, as shown in the cut, which has inch and a quarter rings $+0.25$ S p.— 0.25 S p. and no lens in the center. Several different strengths could be put on the same handle, but it would make it too cumbersome.

When examining with this instrument, I say to the patient, "fix your eye on the last letter of the lowest line you can read."

(generally naming the letter myself). "for I am going to place three glasses before you and I want you to tell me which you *would rather have, first, second or third.*" I prefer using the last letter in a line for fixation, because if you take the first letter it is hard to prevent some patients from roaming all over the line.

It will be seen by this system that the questions and answers are definite. The patient must either choose, *first, second or third,* and when the case gets to the windup, the quick, definite answers will be a surprise to the operator.



Any one who does not use Jackson's Cross cylinder would be helped very much with this instrument by using cylinders as well as spheres. The position of the lenses is under the control of the operator, and they can be folded into the space of one lens.

I have been using this instrument for about three years with entire satisfaction. The speed that it can be changed from minus to plus, especially, by using plus to one side and minus in the middle, is a great help in preventing your patient from getting nervous. Sometimes when I want to convince a patient that I am master of the entire situation, I show them that one of the rings contains no lense. I then alter the combination and continue. Generally, explaining that I am not trying to fool them, but to get their judgment against their will. I also tell them that if they did make a mistake, this instrument would detect it at the next move.

I have always tried to make the examination of the patient as little harassing as possible, and have been surprised to find the help this instrument has been to me in that respect.

J. N. RHODES.

Reports of Societies

WILLS HOSPITAL OPHTHALMIC SOCIETY OF PHILADELPHIA.

Meeting Tuesday, February 4, 1908.

WILLIAM CAMPBELL POSEY, Chairman.

Dr. P. I. Pontius presented a case of rupture of the choroid with obliteration of the optic disk, in a man who had been struck while playing shinney. The site of the disk was occupied by a large round, fluffy white mass, doubtless the remains of extravasation from the ruptured choroid. In discussing this case Dr. S. D. Risley spoke of a case of double rupture of the globe following a blow from a lump of clay and he said he believed no other case of a double rupture had been reported. Norman Risley said he recently had under his care a professional ball player in whom the choroid of one eye had been ruptured by a blow from a baseball.

Dr. Conrad Berens showed a case of granular conjunctivitis in a boy. The disease had been marked, but after thorough rolling and the persistent use of boroglyceride, the conjunctivæ have become smooth.

Doctor Berens exhibited another patient in whose left eye there had been what three years before appeared to be a corneal leukoma following a blow from a baseball. The present condition shows the corneal lesion to be progressing and vascular neoplasm.

Dr. William Zentmayer showed a young man whose right eye had been proptosed suddenly. The exophthalmus extended beyond the plane of the brow. The optic nerve was veiled by exudation and extravasation. Later these conditions were suddenly reduced by a gush of purulent discharge from the nose, evidently from the rupturing of a mucocoele of a sinus accessory to the orbit.

Doctor Posey exhibited the patient who is the subject of a paper detailed below, a tubercular keratitis. The patient had had a clouded cornea which has cleared greatly after injections of tuberculin had been administered.

Dr. Frank Fisher presented a case of gumma of the orbit in a young negress. The diagnosis was obscured until iodides had been pushed and the protiodides of mercury had been used by inunction.

Dr. Norman Risley read "A Case of Recurrent Iritis," illustrating the value of iridectomy:

While the case which I am presenting to you today is not one of great importance, it still is of sufficient interest to me to show it, hoping that I thus may gain the advantage of your experience in the treatment of conditions of a like nature.

R. H. Act. 25, presented himself for treatment at this hospital January 18, 1907. He stated that he was a sufferer from constant, intense, frontal headaches, associated at times with acute ocular pain, the latter being accentuated when he was exposed to the bright sunlight. V = O. D. 6 LX blurred, O. S. 6 XXX. He gave the following history: Was born and lived in England until act. 19. He had had good vision until 15 years of age, when one day he struck the bridge of his nose on a gate, resulting in a severe inflammation of both eyes, with hemorrhage in the tarsal and bulbar conjunctivæ and ecchymosis. From this he made a good recovery. At this time he began to learn the trade of watch-making, but found that he could not see sufficiently with the right eye to use the jeweler's lens, so confined its use to the left. Three years later while at work at this trade, he was suddenly attacked in the right eye by severe pain, lachrymation and increased diminution in vision. He was treated by Doctor Sandford of Plymouth, who gave him local and constitutional treatment. This attack lasted five days. He then came to this country and about one year later while in Boston had a similar attack in the left eye, but with less severe symptoms. Being a stranger in the city he did not seek medical attention until the right eye also became involved. He then became a patient at the Boston Eye and Ear Infirmary, where he was treated without much success for two years, finally becoming discouraged and giving up all treatment for two years.

When he presented himself for treatment at this hospital the conditions present were as follows: There was a narrowing of the palpebral orifices, photophobia, marked ciliary and conjunctival injection. The pupils were contracted to 2 mm., irregular in shape and immobile, not reacting to change of light and shade or accommodation. Repeated instillations of Atropine Sulph., gr. 8 to one fluid ounce, caused only slight, irregular dilatation in the left, and none in the right eye. Oblique illumination and ophthalmoscopic study showed the irides to be bound fast by adhesions to the capsule. An indistinct view of the fundus was obtained in the left eye, showing scattered patches of choroiditis throughout the fundus.

Atropine Sulph. gr. 4 to one fluid ounce and ascending doses

of the iodide of potassium were prescribed and used with marked benefit. After three weeks this treatment was associated with a 2 per cent solution of diosin twice daily, under which the ciliary injection became less and the pain and photophobia disappeared. So long as this treatment was continued, the patient had comparative comfort, though unable to use his eyes for any near work. But all symptoms recurred in from one to two weeks after cessation of treatment. After ten months of these recurrent attacks the patient was persuaded to consent to operative procedures. On November 4th a broad, peripheral, upward, iridectomy was done by Dr. S. D. Risley, on the left eye. This was followed by almost immediate relief of pain and the eye rapidly cleared. In January the same procedure was followed on the right eye (the worse) once with the same result. There has been no recurrence of the iritis and the patient has been free from pain and headache since the operations. The ciliary injection is slowly diminishing.

Doctor Crampton reports: Vision on January 29, 1908, with O. D. —15 \square —50 cy. ax. 135° 6 xx. O. S. —1.50 s 6 xx.

Doctor Posey said he would be slow to operate in such cases for the exudations would surely mar the result. Dr. Samuel Risley said it would be wrong to operate in the progressive attack, yet he believed it wise to operate in extreme cases, but he would always wait as he did in his case, until the acute symptoms had subsided. Dr. Berens spoke of the valuable effect produced by the possible breaking of the iritic adhesions, and he told of the results obtained by the use of the angular coroclisis needles in the skillful hands of the surgeons of a decade or so ago.

Dr. H. L. Picard read a paper upon "Embolism of the Central Artery of the Retina." He had observed the symptoms of embolism of the central artery of the retina in an unmarried woman of 22 years who had had temporary attacks of obscurations of vision. When he first saw her three days after the attack all the characteristic and pathognomonic symptoms of embolism were present. In three weeks the retina had again become transparent, the arteries somewhat filled, although no segmentation had been observed. No hemorrhage. V. faint L. P. She now has attacks of temporary loss of V. in O. S. No history of rheumatism or syphilis.

Dr. D. F. Harbridge of Chester, Pa., said that the expression of an opinion on so speculative a process to be of real value should come from one whose experience has been quite broad, so limited is the opportunity for investigation, as is shown by recent statistics from the St. Petersburg Eye Infirmary that out of 18,000 patients

only eight presented the history and appearance of what we choose to call embolism of the central artery of the retina.

The fact that the time elapsing between the attack and the opportunity for pathological investigation is considerable, and also the possibility of post mortem changes taking place, as recently emphasized by Zentmayer, shrouds the entire subject in considerable doubt as to the true process. Therefore in a measure for convenience sake we designate a group of objective symptoms based largely on a theoretical equation as embolism, the first accurate description of which was given by Von Graefe some fifty years ago.

However, as a practical fact in a given case of embolism of the central artery of the retina, such a conclusion may be only one of many possibilities in a case of blindness due to obstructive causes. Embolism of the central artery of the retina perhaps does very likely exist in a certain percentage of cases, but convincing practical pathological demonstration of this is rather wanting.

As I understand embolism, a small fragment is detached and swept away by the blood current, plugging up either the central artery of the retina or some of its branches, bringing with it more or less temporary or permanent destruction, depending upon the point of lodgment and its permanency. While, of course, admitting this, still it seems to me rather a remote possibility if one considers the cause and manner in which the retinal artery comes off from the ophthalmic at almost a right angle and the ophthalmic in turn almost at right angle from a main channel, the internal carotid; the great tendency, it seems to me, would be for the fragment to follow the flow of the main current admitting the possibility of a fragment migrating to the periphery of the current and when opposite the branch of the ophthalmic artery, passing with the current up that vessel. Still it should be remembered that before entering the retinal artery two such occurrences must take place.

In obstructive conditions of the retinal circulation what might be regarded as a possibility is hemorrhage into the sheath of the optic nerve causing pressure and occlusion of the vessels.

Priestley Smith, some twenty years ago, pointed out as an obstructive cause the very likely presence of a primary thrombosis, particularly where there is a history of previous attacks of transient blindness in the affected eye and simultaneous attacks of blindness in the fellow eye, accompanied with disturbances of the cerebral circulation evidenced by symptoms such as giddiness, faintness, headaches, etc. In this connection, however, it is to be remem-

bered that in the larger arteries particularly stagnant blood does not clot unless the contiguity of the interior is affected, but it is also pointed out that blood carrying certain abnormal products the result of disease (anaemia, toxins, increased viscosity of the blood, etc.) may cause ready coagulibility of the blood in the smaller vessels, at least those forming a primary thrombosis. But this is all largely problematic. Another possible cause which in its height certainly has every appearance of the classic description of embolism of the central artery of the retina and particularly so when followed later by permanent blindness, is spasm of the retinal circulation. Corroborative evidence on this point is not wanting, for arterial spasm is known to exist in Reynaud's disease, migraine, and recently a surgeon while doing an operation in the abdominal cavity witnessed a spasm of the small arteries in a portion of the intestines—in the fundus oculi it has been observed during epileptic attacks. Some ten years ago Wagenmann, Benson and Sachs each had an opportunity to actually observe complete attacks beginning with the emptying of the blood vessels followed by the loss of sight, then refilling of the vessels and restoration of sight. In this class of cases I have had two which I think can be properly recorded here, one particularly in which it was not only my own good fortune to observe but also demonstrate to several of my colleagues. I reported the case at a meeting of the ophthalmological section of the College of Physicians in December, 1905, and published it in *Ophthalmology*, July, 1906. I was able to observe a complete cycle, beginning while vision was still good. The arteries, one after another, emptied themselves, followed rapidly by the veins collapsing, sight being absolutely lost, then there was a refilling of the arteries and veins, immediately followed by a return of sight, the attacks lasting from three to six or eight minutes, recurring at intervals of from half to two hours and covering a period of nine or ten days.

Lastly, a very likely cause which is particularly favorable to the development of obstructive vascular disease—if not directly, certainly indirectly—namely, angiosclerosis, which may be local or part of a general condition. In this condition there may be merely a local thickening of the intima with slight contraction of the muscle fibers (the caliber of the vessel is very small) or a lessening of the blood pressure (heart lesion or passage of blood in another direction of less resistance) causing stoppage, or we may have a proliferating endarteritis, hyperplasia of the elastic fibers and blockage resulting.

Dr. Posey spoke of the significance of attacks of transient monocular blindness due to vascular causes, and said that their occurrence should always render the prognosis for the future of the eye grave, thrombosis of the central artery usually announcing itself in this way. He referred to a number of cases of spasm of the central artery of the retina, which he reported some years ago, in which transient blindness finally gave way to permanent loss of vision in the eye, the blindness being accompanied by all the signs of embolism, though in all probability the spasm of the vessel alone, engrafted upon a diseased intima of the central artery of the retina, occasioned the loss of sight. He referred to a case of monocular blindness reported by Leber, where there were all the ophthalmic signs of embolus but in which the microscope failed later to reveal any evidence of either embolism or thrombosis, Leber attributing the blindness and the pathological findings to long-continued spasm, pure and simple. Doctor Posey said that two of the cases reported by him had since died of apoplexy, evidencing the general vascular degeneration which is present in many cases of transient monocular blindness.

Dr. Picard, in closing, thought that three separate conditions should be recognized in view of our scarcity of knowledge of the subject and the extreme rarity of the disease—embolus, thrombosis and spasm. If embolus was doubted in the eye it must be doubted in every other part of the body, as the eye was not exempt from any disease. Spasm can occur, but it is probably due to autointoxication as the cases cited clear up on the exhibition of calomel and salines. The youth of his patient he thought in conjunction with the absence of a history of rheumatism or syphilis would exclude arterial disease.

Doctor Berens described a new operation for restoration of the socket. This operation consists of procedures whereby the tense contracting bands are ligated and cut between the ligations, and then in the burying of the raw surfaces beneath the conjunctival tissues.

Doctor Zentmayer exhibited a patient on whom the operation described by Dr. Berens had been performed. Enucleation of an eye partially destroyed by caustic lye had left cicatricial bands extending from the apex of the socket forwards and forwards and outwards interfering with the wearing of an artificial eye. Several of the older procedures had been tried without success and finally Dr. Berens' method had been used giving the patient a sufficiently capacious socket for a prosthesis.

Dr. Fisher has not found Berens' operation useful in all cases of contracted sockets, though he has used that method two or three times with marked result.

Dr. Risley said he was grateful to Dr. Berens for devising another operation for this troublesome condition because all other plans have in given instances proved unsatisfactory.

Dr. Radcliffe said he has used this operation in extensive symblepharon with perfect result.

Dr. Berens, in closing, said this operation conserves and reforms the conjunctival socket.

The report of the pathologist, Dr. Goldberg, was read by Dr. Berens.

SECTION OF OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting April 16, 1908.

DR. HOWARD F. HANSELL, Chairman, presiding.

Rupture of an Artificial Eye.

Dr. S. D. Risley exhibited a reformed artificial eye in which a rupture of its posterior concave surface had occurred suddenly while the patient was facing a cold wind. The soft tissues had been drawn into the central pear-shaped window, caused by the rupture, so forcibly as to cause severe pain and make removal of the eye difficult. He believed the accident was due to the deviation in the radius of curvature between the two surfaces of the eye, produced by the sudden change of temperature of the exposed convex surface. The contraction under cold he thought would tend to shorten the anterior surface, which could not occur without traction upon the periphery of the attached posterior concave surface, which would tend to straighten it like a bow-string. The rupture of its surface which occurred at its center was ballon-shaped, and the outlines of the opening were approximately concentric with the peripheric outlines of the eye.

Ocular Symptoms of Ethmoidal Disease.

Dr. Frederick Krauss presented a paper on the Ocular Symptoms of Ethmoiditis, in which he urged early diagnosis and operation before serious symptoms of pus along the course of the optic nerve appear.

He cited four cases of various types of the disease. After a review of the symptomatology, the author described an operation

for the tumor of posterior ethmoiditis, which consists of the formation of a channel beneath the periosteum extending from the incision (along the superior and inner orbital margins) to the growth. The carious areas are thoroughly curetted and a large opening made into the nose, through which a drainage tube is passed. The wound is then stitched. As healing takes place by first intention, the resulting scar is practically imperceptible.

Dr. Posey said that it needed but a glance at the current literature to convince one that the ocular manifestations of disease of the accessory sinuses was receiving the recognition which this phase of ophthalmology demands, a recent number of the London *Ophthalmoscope*, for example, being given over entirely to the subject. While Dr. Krauss' paper was most instructive and gave original interpretations to many of the conditions encountered in orbital disease from sinus affection, Dr. Posey did not believe that it was possible to create a symptomatology for any particular sinus or set of sinuses. The extent of the sinuses was often so anomalous and their position so varied that the symptoms of disease of the various air cells frequently merged into one another. Again, inflammation of a sinus might set up ocular symptoms remote from the sinus, and he had noted edema of the upper lid as the only ocular symptom of antral disease. In a paper which he had read some years ago Dr. Posey said that he had called attention to the involvement of the optic nerve which is present in even beginning cases of sphenoiditis and ethmoiditis, as evidenced by a lowering in the light sense, and by the choking of the lymph streams along the retinal vessels. He had frequently noted asthenopia in connection with disease of the sinuses and pointed out that in marked cases of orbital involvement the shape of the globe itself may be altered by pressure, but that even in less marked acute cases he had noted a change in refraction, due apparently to some interference with the ciliary muscle, but whether this was due to vascular or innervational changes or to the action of toxins generated by the disease of the sinuses upon the accommodation, he had been unable to determine.

Dr. Zentmayer said that he quite agreed with Dr. Krauss as to the importance of publishing such cases as he had presented in his paper this evening, because, notwithstanding that the subject has been dwelt upon considerably in recent literature, palpable cases were still continually overlooked. Last January there came to Wills Hospital a man, aged twenty-four years, who stated that in September, 1907, he first noticed that his right eye was becom-

ing prominent, and that in two weeks' time the bulging was very pronounced. His only illness has been grippe five years previously. He was not subject to colds in the head, but had had frequent nose bleed as a child. He had absolutely no other nasal symptoms.

The proptosis was very marked, the lateral excursions of the globe were somewhat restricted V. = 1/3; light sense was disturbed, but there was no central scotoma. The inner margin of the disk was veiled and the lymph sheaths were distended. His accessory sinuses were examined by Dr. Marshall, whose immediate report, after thorough constriction of the mucous membrane with adrenalin and cocaine, was that there seemed to be nothing wrong. The next day, however, the patient reported that a fetid purulent discharge had appeared in the nose. This has continued, and with it there has been a steady improvement in all symptoms.

According to his physician the patient had been treated by a local ophthalmologist for dacryocystitis, and was using for it a zinc wash.

Dr. Risley was convinced that we were just beginning to appreciate the grave significance of many affections of the eye associated with disease of the nasal passages and the accessory sinuses contiguous to the orbits. Since the publication of his paper presented to the Pennsylvania State Medical Society, at York, Pennsylvania, in September, 1903, he had become more and more deeply impressed by their importance. He had been unable to relieve many cases of persistent and rebellious asthenopia and other affections of the eye until the inflamed and blocked sinuses had been relieved, and referred by way of illustration to one striking instance with persistent and violent headache, swelling of the optic nerves, and contracted fields of vision in a patient who had finally been relieved only after amputation of the middle turbinates, which was immediately followed by a profuse discharge of pus from the ethmoidal cells.

Dr. Hansell said in all cases of apparently idiopathic optic nerve atrophy he was accustomed to have a careful examination made by a rhinologist, and believed a large proportion of such cases was due to disease of the sphenoidal sinus. Many cases show nothing at a first examination, but reveal extensive involvement subsequently. Asthenopia had not been a prominent symptom, in his experience, but more often reduction of visual acuity, and alterations of the fields, with scotomata.

In closing, Dr. Krauss said, in reply to Dr. Posey's remarks, that it was not always possible to differentiate between posterior

ethmoiditis and sphenoidal sinus disease, but that posterior ethmoiditis was probably the one which most frequently gave rise to the more striking ocular symptoms. The variation in the severity of the symptoms of the different sinus diseases is due to the fact, as pointed out by Onodi, that the bony septa between the sinuses and important ocular structures vary greatly in thickness. Venous and lymphatic communications are also important factors.

Nevus Removed by Electrolysis.

Dr. Risley presented a patient with a large nevus of the left lower eyelid upon which he had operated four weeks before by electrolysis. A single operation had resulted in a nearly complete restoration of the part without any deformity resulting from the displacement of the eyelid. He had often employed electrolysis in nevus and other affections, but in this case had adopted a different procedure. Instead of placing the positive pole on the cheek or back of the neck, with the negative pole in the tumor, both needles were thrust into the growth from opposite sides, parallel to each other and close to its base, about 3 mm. apart, and allowed to remain approximately one minute. The tumor was then coated with collodion and a compress bandage applied. The absorption was rapid and complete; at the end of four weeks only a slight doughy thickening and some discoloration remained.

In answer to a question by Dr. Hansell, Dr. Risley said he thought the action of the electrolysis was more effectual in using the two needles than when he had used the single needle attached to the negative pole.

Dr. Posey said he had used the Wyeth method of injecting boiling water into a vascular nevus, in one instance several applications being necessary. He had also employed electrolysis, but had used only one needle.

Gonorrheal Uveitis.

Dr. Howard E. Hansell exhibited a patient with Gonorrheal Uveitis. The patient was a sailor, aged twenty-two years, who five years earlier was confined to bed for three months with articular rheumatism. Two years ago he had specific urethritis, followed by articular rheumatism and inflammation of the eyes one month later. The ocular disease, judging from his description, was iritis or iridocyclitis. He was admitted to the Philadelphia Hospital February 22, 1908. Two weeks earlier he had a second attack of gonorrhea, followed in a week by rheumatism and in ten days by ocular inflammation. The latter corresponds closely with

Byers' description of the gonorrheal type of iritis (studies from Royal Victoria Hospital, Montreal, February, 1908), presenting the numerous and plainly to be seen deposits on the lower half of Descemet's membrane, the unusually deep anterior chambers, and the moderate amount of iritic exudation. The synechiae in the right eye have been completely torn away by the treatment and V. = 20/20. Vision in the left eye is decidedly lowered on account of large and dense opacities in the vitreous. The left was the more intensely inflamed eye, as is shown both by the annular synechiae and the exudation into the vitreous. Examination of the aqueous humor of the left eye showed no gonococci, only the zerosis bacilli, probably derived from the conjunctiva. Two cultures made from the blood were also negative. The treatment consisted in the use of the salicylates in large doses and daily sweat baths, and, locally, atropin and hot compresses.

It is impossible to state, even with approximate accuracy, the proportion of uveitis of gonorrheal origin, but taking the average of figures given by different authors, 10 per cent or 15 per cent may represent its frequency. Statistics are bewildering, since many of the cases ascribed to rheumatism and syphilis should be classified as gonorrheal. Moreover, some clinicians have not considered gonorrhea as a possible cause, and no mention is made of this disease in their lists.

Opportunities for studying the pathology are rare, for the eyes affected seldom come to enucleation. The prognosis is almost uniformly favorable including those cases in which the anterior chamber contains at the height of the inflammation a membranous and gelatinous deposit, and vision is reduced to the perception of light. As in most instances of iritis from this and other causes, the inflammation is not limited to the iris, but includes the ciliary body and the anterior portion of the choroid, and is essentially a cyclitis or iridocyclitis. We have acquired the habit of designating an anterior uveitis as iritis because probably the changes in the iris are evident, while those in the ciliary body and choroid are hidden.

Dr. Freeseolt, of the Philadelphia General Hospital, said that the gonorrheal discharge was profuse, and when it ceased the eyes improved at once. In one blood culture diplococci seemed to be present, but subsequent cultures were negative.

Dr. Posey showed a man, a negro, aged thirty years, with pronounced uveitis in both eyes, in whom he thought the ocular inflammation might have been caused by gonorrhea, as the patient

had had a urethritis in the autumn, and synchronous with the appearance of the ocular symptoms a month previous to consultation there had been rheumatic pain in the shoulders, and there was now some enlargement and thickening of the sternoclavicular articulations. The interstitial lamellae of both cornea were densely infiltrated with exudate, so that the irides could be barely seen. Dr. C. Y. White had made one negative blood culture, which was not considered conclusive of the non-gonorrheal origin of the inflammation. Acquired syphilis was denied, but congenital lues could not be excluded.

An Unusual Form of Congenital Squint.

Doctor Wm. Campbell Posey reported an Unusual Form of Congenital Squint occurring in a boy aged fourteen years. The face was asymmetrical, the lower part being markedly underdeveloped, the chin being small and receding. The left orbit appeared broader than its fellow and the corresponding side of the face was flattened. The palpebral fissures were obliquely placed, both external angles being directed down and out. The arch of the palate was high, but the teeth of both jaws were all present and regular.

Both eyes appeared of equal size. The right pupil was 3 mm. in size, the left 4 mm. Both irides reacted well to light and accommodation stimuli. O. D. V. equalled 5/5; O. S. V. but finger-counting at 4 m. H. equalled 1 D in each eye. There were no changes in the fundi.

When fixing, the left side of face presented and both eyes were focussed upon the fixing object. When the head was brought into the primary position, however, and the patient asked to fix, the right eye alone fixed, the left deviating somewhat downward and outward. When the fixing object was carried to the left, the left eye fixed, and the right shot up and in, due to an overaction of the right inferior oblique. When, on the other hand, the examining object was carried to the right, the right eye fixed, and the left shot up and in, the upward and inward deviation being more pronounced than that observed in the right eye when the eyes were directed to the left.

In left monocular fixation it was noted that inward motion in the median line was abolished, that upward and inward motion was poor, while downward and inward motion was well conserved. Motion directly upward was excessive, while straight downward motion was limited; downward and outward motion, as well as out-

ward motion in the median line, were normal. In monocular fixation of the right eye all the movements of the eye appeared to be normal. Movements of the jaw had no influence upon the ocular excursions or movements of the lids.

Dr. Posey thought that the limitations of movement in the left eye were best explained by complete absence of function in the left internal and superior rectus muscles, and by a partial loss in the inferior rectus muscle. Advancement of the left superior rectus muscle was advised, with a view to bringing the left eye into normal position in primary fixation, other procedures to be resorted to later, after the eyes had adapted themselves to the changes effected by the advancement.

The particular grouping of the muscular insufficiencies exhibited in this case has never before been encountered by the writer, the deviations differing from any of those observed in the seventy cases of congenital squint which were reported by him before the Ophthalmological Section of the American Medical Association last year.

Doctor Posey thought, however, that the deviations might be explained either by a partial palsy of the left third nerve as a consequence of pressure in its passage through an abnormally small orbital fissure in the imperfectly developed skull, or to structural anomalies in the muscles themselves, with perhaps the formation of fibrous bands, as has been discovered in other not very dissimilar cases.

Traumatic Rupture of the Choroid.

Doctor Frederick Krauss presented a case of Traumatic Rupture of the Choroid in a girl, aged fifteen years, who was struck in the right eye by a stone from a slingshot. The following day the vision was 1/40 of normal. The ophthalmoscope revealed enormously dilated retinal veins. The disk edges were indistinct. The retina was very hazy, especially about the disk, and below and out to the macula. In the macular region there was an irregularly shaped hemorrhage, running through the center of which was a triangular shaped rent of the choroid. The left eye was normal. Two days later, under atropine, the pupil dilated oval, but was eccentrically placed, owing to the fact that the temporal side of the iris refused to dilate, probably due to overfilling of the blood-vessels of the iris and ciliary body. There were no synechiæ.

One week after the accident the haze of the retina had partially cleared, showing a second semicircular rent of the choroid.

extending from a point midway between the disk and macula, parallel to the disk downward. The macular rent had greatly increased in length. Beyond the macula there were many fine striate lines radiating outwardly. The vision had increased to 5/30 of normal, the pupil being fully and evenly dilated. The treatment pursued consisted of rest, iced compresses, atropine, and boric acid.

EDWARD A. SHUMWAY, Clerk.

REPORT OF SECTION ON OPHTHALMOLOGY, ST. LOUIS MEDICAL SOCIETY.

Meeting of February 12, 1908.

Reported by Dr. Llewellyn Williamson, Section Editor.

Presentation of Specimen.

By Dr. A. Alt. The eye shown here I removed a week ago from a syphilitic individual. It has been blind for several years and suffering from ever-recurring attacks of cyclitis dolens. The most interesting part is what, externally, appears to be a beginning equatorial staphyloma. When I bisected the eye I found a large atrophic spot in the choroid, as you see here, corresponding with this apparent staphyloma. On cross-section, it is, however, plainly seen that, instead of a thinned and bulging sclerotic, we have before us a thickening of the tissues starting from the choroid and involving the sclerotic. I think, therefore, that this represents a healing gumma of the choroid and sclerotic. The patient has been under antisyphilitic treatment for some time. (The microscopic examination proved this view to be correct.)

A Case of Retinitis Pigmentosa.

By Dr. John Green, Jr. This case differs from the typical retinitis pigmentosa only in the sparse distribution of the "bone corpuscle" pigment masses. It has been stated that certain cases otherwise indistinguishable from this disease may be wholly without pigment—opinions of the members regarding this point are requested.

DISCUSSION OF DR. GREEN'S CASE: Dr. J. Ellis Jennings had observed one or two cases of what he believed to be retinitis pigmentosa without pigmentation.

Dr. Hayward Post had had two cases in which there was a contracted field but no pigmentation. One of these cases he believed had been at one time in the hands of Dr. Shoemaker.

Dr. A. E. Ewing had seen one case of retinitis pigmentosa in which there was a shrinkage in the field but no pigmentation that he could detect.

Sudden Blindness Following Injury. Presentation of Patient.

By Dr. Llewellyn Williamson. This patient presented himself at the clinic of the Washington University day before yesterday, stating that ten days ago he had been struck in the eye with a brick. There is still some contusion and a scar over the right brow. After being struck he felt very dizzy and held his hand over his eye for some time. Upon removing it, he found that he could not see. When first seen, his pupil was dilated, immobile and with absolutely no light perception. The ophthalmoscopic examination showed a large hemorrhage to the upper and outer side of the disc and a small hemorrhage in the region of the macula. No other findings. Why this man is absolutely blind I am rather at a loss to know. There may be a hemorrhage in the sheath of the nerve or there may be a fracture of the orbit with injury to the nerve itself. The fact remains that he has absolutely no perception of light. Possibly some of you gentlemen can discover the reason for it.

DISCUSSION OF DR. WILLIAMSON'S CASE: Dr. Henry Muetze thought the blindness was due to injury to the optic nerve. There is quite a dent in the supraorbital ridge. Undoubtedly when the man was struck the roof of the orbit was driven back, partly, or entirely, severing the nerve. He had seen a somewhat similar case several years ago in which a railway conductor had been injured by being struck by a mail crane. It had seemed probable in that case also that the blindness was due to injury to the nerve and the diagnosis was borne out by a complete atrophy later. Yet one should be guarded in the prognosis of these cases. He had seen, not long before, a patient, a physician, who had fallen on the sidewalk and sustained a severe injury to the base of the skull. In this case there had been only recognition of movements of hand at 3 inches, total absence of recognition of colors and marked blanching of the disc within a few weeks after the injury. The usual treatment had seemed of no avail and had been abandoned after a couple of months. The speaker has given a very grave prognosis. The patient spent several months in Europe and upon his return it was found that his vision was about 10/20. After that experience, Dr. Muetze thought one could not be too careful in the prognosis of those cases of injury to the optic nerve in which absolute blindness does not supervene shortly after the injury.

Dr. Adolph Alt said that before making a definite statement that he would like to be certain whether the hemorrhage was in front of, or behind the retina. In one of his cases, following an

attempt at suicide by shooting, there had been an extensive rupture of the choroid and a rupture of the retina. It might be that in this case these hemorrhages were not in the retina but in the choroid. Of course the blindness was due to a fracture of the optic foramen in whatever way that was produced.

Dr. Williamson stated that this was a retinal hemorrhage; that there was no sign of rupture of the choroid. The exact character of the injury he could not definitely determine but the prognosis he thought was probably bad.

Opaque Nerve Fibres. Exhibition of Two Unusual Cases.

By Dr. J. F. Shoemaker. Opaque, or medullated, nerve fibres were first demonstrated by Virchow, anatomically, before the days of the ophthalmoscope.

The medullation of nerve fibres occurs late in intrauterine life and begins centrally, proceeding toward the periphery. The optic nerve is the last of the cranial nerves to become ensheathed according to Westphal, and von Hippel states that it is not until one or two months after birth that the process has extended to the eyeball, where it usually stops. Occasionally some of the nerve fibres take on the medullary substance after they have passed through the lamina cribosa. In the rabbit there is normally a transverse band of these opaque fibres. In man, when they occur, they are usually around the papilla and contiguous to it. Generally situated above or below the disc, they may be on the nasal side or, very rarely, on the temporal side. When occurring on the temporal side, they stop short of the macula, as a rule, although Hawthorne states that they may involve the macula, when, of course, central vision is absent.

Wagenmann and Nettleship have made the interesting observation that where medullary nerve fibres are present in the retina they lose their medullary sheaths when the fibres degenerate, as for example, upon the onset of optic atrophy. Pflüger has demonstrated the same facts in rabbits. Frost has made similar observations in glaucoma.

The point of interest in the two patients presented, is the unusual position of the opaque fibres. In the one case there is a good sized spot of them in the upper temporal quadrant of the fundus, about four disc diameters from the optic nerve, the rest of the retina being normal. In the second case they are situated in the lower nasal quadrant, between two and three disc diameters from the nerve; the retina, otherwise, being entirely normal.

The appearance of the opaque fibres in the periphery of the fundus is quite unusual, no mention being made of their being found in such position by such authors as Fuchs, Swanzy, and de Schweinitz.

DISCUSSION: Dr. Clarence Loeb stated that this was the first case he had seen of opaque nerve fibres at a distance from the disc. It would be very interesting to see a field of vision chart, and an outline made of the opaque fibres.

Dr. Llewellyn Williamson, while assistant at Moorfields, had seen a case in which there was a large bunch of opaque nerve fibres, at a considerable distance from the disc and not in any way connected with it. It was looked upon as quite a rarity in that hospital where the clinical material was enormous.

A Case of Sarcoma of the Right Orbit.

By Dr. Henry Muetze. The patient, a boy of 13 years of age, was struck in the right side of the nose and the corner of the right eye, in June, 1907. Soon afterwards a swelling appeared, which at the time of the first examination extended from the inner part of the roof of the orbit to the wing of the nose and from the root of the nose to the inner canthus, encroaching considerably upon the eyeball. Removal of the tumor, which was found attached to the bone at its superior posterior aspect, was performed. Microscopic examination was frustrated by accidental loss of specimen. About $2\frac{1}{2}$ months later recurrence of the growth was observed. A second operation was performed and the tumor, besides occupying its former location, was found to extend across the bridge of the nose to the inner canthus of the left eye. This and the entire posterior portion had to be removed by means of a chisel from the bone, to which it was firmly adherent. . .

On the seventh day after the operation slight exophthalmos manifested itself. As the fundus appeared normal but vision was reduced to 20/80, it was surmised that another nose growth was forming in the depth of the orbit, causing diminution of sight by retro bulbar neuritis, due to pressure on the optic nerve. Microscopic examination proved the neoplasm to be a small round cell sarcoma.

The prognosis of sarcoma of the orbit is very grave. The neoplasm invades and infiltrates the surrounding tissue so rapidly that complete removal is almost impossible. If the patient does not succumb to an extension of the primary growth, a fatal termination is frequently caused by metastases. A third operation has been

considered advisable since and complete exenteration of the orbit has been performed by Dr. H. G. Mudd.

Dr. Adolph Alt had had experience with a number of such cases, always in small children, where the tumor was always a round cell sarcoma. After operating on the last case, he had determined never again to operate on another case without a complete exenteration of the orbit. In one case he had cleaned out the orbit as thoroughly as possible, the child had almost died on the table, yet in three months' time there had been a return of the growth. To avoid a fatal result, it was necessary to take away not only the tumor but the whole orbital tissue.

Dr. Williamson showed two pictures of a case he had seen last spring. One picture taken at the child's first visit showed an almost imperceptible bulging of the eye. The other picture, taken seven weeks later, showed an enormous proptosis, the eye being almost out upon the cheek. The child was operated upon by the country practitioner, but four weeks later was sent to the Martha Parsons Hospital in St. Louis, with a return of the growth, the tumor mass filling the orbit and involving both lids. Complete exenteration of the orbit with removal of the periosteum and both lids was performed, but the growth again returned, although very slowly. An effort was made to try the effect of Coley's Fluid, but before a supply could be obtained from New York, the mother took the child away, refusing all entreaties to leave it longer in the hospital. Shortly after the child was taken home, it became blind in the other eye and soon died. The whole course of the case was about three or three and a half months. Operative procedures in these cases never seemed to avail much.

Dr. John Green, Jr., stated that last summer he had seen a case at the Skin and Cancer Hospital in consultation with Dr. George S. Drake, in which there was a tumor of the orbit and a complete destruction of the globe. Dr. Drake did a very thorough operation. Of course, after such an operation there was the greatest deformity. To obviate this as much as possible, Dr. Drake brought down a piece of skin from the brow and sutured it in place below. The wound had healed very well and the deformity was much less than if no attempt had been made to fill the gap. Replying to a question by Dr. Ewing, Dr. Green stated that the patient was about 60 years old.

Dr. Henry Muetze asked if any of the gentlemen had ever seen one of these cases of round cell sarcoma recover.

Dr. Clarence Loeb, while with Dr. Barek, had seen a case in

which Dr. Barek had been forced to do a complete exenteration of the orbit. The tumor had been operated on once before. The operation, done by Dr. Barek four years ago, had been followed by recovery. The patient was forty years old, or over. He could not state the nature of the growth.

Dr. Green referred to a report by Dr. Fox of Philadelphia of a case in which he had had a surprisingly good effect from the use of the x-rays. The growth in this case had been enormous and inoperable, yet the x-ray produced to all intents and purposes a cure. This case was reported about four years ago at a time when there were many good reports of the x-ray being published.

Dr. H. W. Luedde spoke of the case of a little girl presented at the November meeting. The tumor had pushed the eye up and was entirely within the orbit. Dr. Mudd had done a complete exenteration, but the growth had returned and the child became blind in the other eye and finally died.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

At the meeting of the society, held at the hospital on Tuesday, April 7, 1908, at 3:30 p. m., Wm. Campbell Posey, M. D., in the chair, several clinical cases were shown and a formal program was presented for discussion.

Dr. Schwenk exhibited two patients: one showing "the early result of a plastic operation for repair of eyelids," which had been deformed after lacerations following a dynamite explosion; the other illustrated a "cured abscess of the cornea." In speaking of the Saemisch operation, Dr. Schwenk said that he uses a narrow Graefe knife, which he enters in sound cornea with the back of the blade at right angles to the plane of the iris. The counter puncture is made in sound cornea beyond the necrotic area; the knife all the while is pressed back against the iris. After the counter puncture is made the blade is rotated gently on its long axis to drain the aqueous slowly and to prevent the rapid protrusion of the iris and lens. The incision is then gently completed through the necrotic area. By this method the iris is prevented from falling into the wound and synechias cannot form.

Dr. Goldberg reported a case of "sympathetic ophthalmitis following implantation of a gold ball into the sclera." Following a coal injury, the eyeball was eviscerated and a gold ball implanted. Seven weeks later the sound eye became inflamed, presenting all the characteristic symptoms of sympathetic irritation. After enuclea-

tion of the stump, the sclera and nerve were found tremendously thickened, the nerve measuring in cross section 5 mm. in thickness. The external half of the tissues composing the sclera were made up of dense white fibrous tissue with very little elastic tissue, while the internal portion was composed of connective tissue, areolar in type, quite cellular, and contained elastic tissue in considerable amount. Next to the vitreous cavity was another layer of fibrous tissue, which was filled with mononuclear leucocytes and new connective tissue cells. Mononuclear leucocytes were found to predominate everywhere throughout the section with so much persistence that special attention was called to this point. There were no traces of uveal tissue in the entire specimen, which fact presents another phase in the causation of this dread disease. Dr. Goldberg thought this was especially interesting in consideration of the recent work on this subject, where the presence of certain cells in the uvea is looked upon with so much significance.

Dr. Fisher exhibited a five-month-old child with "signs of advancing buphthalmos." This little girl was brought to the hospital in January. There were signs of plastic iritis in the right eye and the cornea was seen even then to be larger than its fellow. The diagnosis of glioma was not entertained because the fundus was clear, and as the child has been under close observation no signs of a neoplastic formation have been present. The eye is not inflamed, but the cornea and globe are steadily increasing in size.

Dr. Fisher then read a classical paper on "Buphthalmos, or Keratoglobus," and he showed a man upon whom he had operated by "iridectomy for the relief of recurrent iritis."

Dr. Zentmayer said that he believed buphthalmos to be an expression of iridochoroiditis, which begins as an iritis and is accompanied by serious choroiditis. Dr. Fisher's case is the only one he has seen with developing buphthalmos.

That prenatal iritis may occur was probably first proved by Mackenzie. Ole Bull saw posterior synechia in infants within a few hours after birth. Alexander observed four cases, all in children of syphilitic mothers. Lawson saw traces of a past iritis in a child with a syphilitic eruption. But the extreme rarity of its occurrence is evidenced by the fact that (according to Ball), Carpenter, of London, never saw an undoubted case of iritis among the hundreds of syphilitic infants that he has examined. The elder Hutchinson records only twenty-three cases of iritis occurring between the ages of six weeks and sixteen months. That syphilis was the cause of

the iritis in the cases of Bull was confirmed by the appearance later of snuffles and of mucous patches about the anus. Alexander is of the opinion that prenatal iritis is of more frequent occurrence than is generally supposed, but that it is not detected because of the fact that infants usually have their eyes closed and that the inflammatory phenomena are not pronounced. Ball states that owing to the absence of ciliary injection and the infrequent occurrence of discoloration of the iris it may be readily overlooked and adds that it can generally be detected only by the use of atropin and oblique illumination. That the disease may occur very early in uterine life is shown by the fact that in many of the cases the inflammation had run its course at the time of birth. The development of buphthalmos in Dr. Fisher's case is of special interest to me because the very few instances of this condition I have seen have presented themselves after all inflammation had subsided. It would seem that, in this case, there may have been associated a serous type of inflammation of the choroid.

The earlier observers assert positively that acute non-inflammatory iritis occurring in the early months of life or during juvenility is always of hereditary origin. We know now that this dictum must be modified to include, at least, tuberculosis.

A serious type of irido-choroiditis occurring among 26 individuals between the ages of less than 3 months and 4 years, 10 of whom were the subject of hereditary syphilis, were some years ago collected by Nettleship. All of them were under 2 years of age when the disease was first noted. The severity of the inflammation varied. In several, the appearances were quite near enough to those of glioma to require great care in diagnosis. In others the inflammation was of an even severer form and was of a nature similar to the usual syphilitic retinochoroiditis. In one instance buphthalmos developed.

Walton saw three cases of iritis in early life complicated with vitreous opacities in one of which interstitial keratitis later appeared.

According to Jonathan Hutchinson, the average age at which infantile iritis shows itself is about 5 months. More females are affected than males. The disease affects one or both eyes. The inflammation is rather insidious although there may be considerable plastic exudate. The cornea usually remains clear. Some of the characteristic signs of inherited syphilis are usually to be found in those affected.

Dr. Harlan said he had not seen iritis in very young children.

He also believed, with Abadie and others, that buphthalmos is an expression of choroiditis.

Dr. Posey said he had looked upon Fisher's case, when he first saw it, as one of glioma of pars ciliaris retinae. The diagnosis at that time was difficult, for the cornea was not known to be larger than the cornea of the other eye.

Dr. Risley said that he had no doubt as to the occurrence of prenatal iritis but believed it was often overlooked. It occurred in puny children, the victims of some inherited cachexia, usually syphilitic, and the inflammation was of the low grade type, characterized by slight ciliary injection, turbid aqueous, a bluish gray cornea, and probably with but little pain. The disease was therefore, he believed, overlooked by the nurse, parents and the doctor until the child was old enough to observe surrounding objects. When the parents are led to doubt the child's ability to see it is brought for the first time to the ophthalmic surgeon for an opinion. He then finds the sequelae of long standing uveal disease which may or may not have had its inception in utero.

Dr. Fisher recalled from memory the case of a child, a week old, that was treated by Dr. Douglas Hall for ophthalmia neonatorum in one eye, the fellow eye of which showed marked iritis as was evidenced by dense synechias.

Dr. Schwenk reported the removal of a large foreign body, by means of a magnet through a recent opening in the cornea. The foreign body was wedge-shaped, measured 10 mm. in length and 5 mm. in width and weighed 4 grains. The ball was retained until sympathetic irritation was manifested, when it was enucleated. It was much disorganized and much contracted. He stated that the magnet is a useful instrument for the removal of particles of steel from an eye, but he believes its use often defers enucleation, and inclines us to retain an eye which later may give rise to sympathetic irritation in the fellow eye. Patients think that the removal of the piece of steel plus the time necessary for the ball to heal, to be the end of all treatment, and decline to have the ball removed, even if advised by the surgeon. Dr. Schwenk offered as a question in medical casuistry, as to whether or not a surgeon is bound to urge the performance of enucleation when patients and their friends refuse to allow the removal of a damaged eye?

Dr. Risley thought that Dr. Schwenk had done good service in calling attention to the serious ocular conditions which remain after the extraction of metallic foreign bodies from the vitreous chamber with the magnet. He wished to call attention not only to the

serious traumatism always inseparable from this class of injuries, especially from considerable masses of metal, but to the added danger from the use of a powerful magnet where the foreign body weighed several grains. To illustrate, he cited a case, already published, in which a foreign body weighing $2\frac{1}{2}$ grains had emerged from the eye with the speed of a bullet carrying a large portion of the iris with it, and fastened itself upon the tip of the magnet ten inches from the eye.

Dr. Zentmayer stated that at the American Medical Association meeting last year he had emphasized the danger attendant upon magnet extractions, when accompanied by considerable trauma, particularly so when the patient was loath to part with an eye after the foreign body had been extracted. The surgeon, in some cases, possibly, was less insistent upon enucleation than he would be in a case with an equal degree of trauma from some other cause. In consequence we occasionally see patients with eyes retained that are a constant source of danger to the fellow eye.

Dr. D. F. Harbridge read a paper on the "Substitutes for Enucleation." He believes it is the duty of the ophthalmic surgeon to give full recognition to disfiguring effects caused by the removal of an eye because of the value the patients put upon their good looks. He therefore urges the adoption of surgical procedures which shall afford a stump which shall give prominence and movement to an artificial eye and thereby improve the cosmetic effects. Yet substitutes for enucleation are but rarely used; and as some surgeons regard such procedures as dangerous surgery, the author asked the following questions: Are these operations desirable for cosmetic purposes? Does the percentage of successes warrant the time, patience, and skill necessary to obtain good results and the increased loss of time on the part of the patient? Can as good or better results be obtained by some more simple procedure? Does the reform eye of Snellen secure the end sought for in performing one of the substitutes for enucleation?

Admitting an occasional failure, nothing, in his opinion, is lost, but on the contrary a distinct advantage is gained by the admirable stump formed by the sutured muscles and tissues. Many substances have been used, such as paraffin, wax, rabbits' eyes, gold and glass spheres, etc. Harbridge has found the gold spheres most satisfactory. Before inserting the sphere he exercises the greatest care to have the cavity clean and free from all hemorrhage.

Harbridge's experience in the use of substitutes has been lim-

ited to the placing of a gold sphere in the sclera, in Tenon's capsule, and to the abscission of the cornea.

In a series of twelve cases ranging from five months to four years since the operation, five were Mules' operation, with good results; two were abscissions of the cornea, one of which developed sympathetic irritation; five were implantation of a sphere in Tenon's capsule, two of which were failures.

The reform eye does not always give sufficient prominence or perfect movement.

Dr. Ziegler said he does not perform Mules' operation, because in that procedure there are remaining attached to the globe all the elements of what we believe to be the essentials in the causation of sympathetic ophthalmitis. He believes that if the tissues are very closely dissected from the ball we can get a stump sufficient to hold the shell and obtain fair movement of it. He recalled a case of ophthalmitis occurring three months after a Mules' operation. In abscission of the cornea he prolongs the line of suture by a V-shaped incision. Even this substitute does not remove the probability of irritation following. Optico-ciliary neurectomy may be safe, and it preserves the good appearance of the globe. He has done only one implantation.

Dr. Zentmayer said that of late he had sutured the muscles to the conjunctiva before enucleation and had been pleased with the improvement in the results. Regarding the occurrence of sympathetic trouble coming on after one of the substitutes for enucleation had been performed, it must not be forgotten that it sometimes follows enucleation many days after the operation. In one of his own cases a very decided serious type with marked neuroretinitis occurred two months after enucleation.

He believed that in selected cases the three substitutes mentioned by Dr. Harbridge were worthy of trial, although in his hands he did not believe that the immediate successes had been more than 60 per cent. He has one case where the ball in Mules' operation has been retained for eight years.

Dr. Posey said he was grateful to Dr. Harbridge for calling attention to the value of Mules' operation, for he trusts in that operation when there is no probability of sympathetic disease impending. In selecting this procedure he is guided by the social condition of the patient. He does not hesitate to use it in private practice, because such patients will appreciate the gravity of the case and they will report at once at the onset of any dangerous

symptoms. Hospital patients are usually careless of directions given to them, and he advises only enucleation for them.

The insertion of too large a ball he believes may interfere with the result. He uses a small ball. He does not wait to stop all hemorrhage, for the clot may help form the stump. He believes that he gets greater security by making the lines of suturing at right angles to each other. Paraffin in the shape of cold balls has given good results in his hands in selected cases.

Dr. Fisher agreed with Dr. Ziegler and does not approve of any substitutes for enucleation because they retain the elements which favor the development of sympathetic trouble and they are therefore dangerous.

Dr. Risley did not wish any statement condemning *in toto* the Mules' operation to go out from the Wills Hospital staff unchallenged. He could cite twenty cases, most of them occurring in private practice, in none of whom had any trouble of any kind followed, although many of them had been under observation for periods of time varying from a few months to fourteen years. The cosmetic results and the continuous comfort of the patient, he believed, were not secured in the same measure by any other procedure. He had always inserted a glass ball and thought it should be of a size to fit snugly the sclerotic cup; that the scleral sutures should be numerous and deeply placed and when finished the suture line should be horizontal, i. e. parallel with the fissure of the lids, and not vertical. In enucleation he thought suturing the conjunctiva and subconjunctival tissues improved the stump and shortened convalescence. He had tried a paraffin ball with a high-melting point in the capsule in two cases, but would not do so again.

Dr. Risley did not think that a Mules' operation or any other procedure leaving an open stump, excepting enucleation, should be undertaken in a case of suppurating panophthalmitis.

Dr. Harbridge said he does not use glass balls because they are likely to become eroded and are liable to be broken. He selects spheres of less size than the socket; and he inserts six or seven sutures quite deeply and in the vertical meridian.

Dr. Ziegler, in speaking of the "galvano cautery as a substitute for the knife in plastic operations," said that the cautery saves the tissues and by its use there are no disfiguring scars. The cautery is in the form of a wire loop point, with which punctures are made into the tissues. He photographs the parts before operating. In ectropion operations he uses a special fenestrated clamp, which

has the advantage of fixing the lid, of protecting the globe, and serves as a guide for the line of puncture. Cauterization is of great service in spastic entropion after cataract operation, or in that accompanying keratitis, and in trachoma with pannus; here the lids may be cauterized, and a pericorneal scarification will act as did the old peritomy.

Dr. Radcliffe said he had used this galvano cautery with much success in cases of trachoma. In one instance he obtained excellent results by four punctures in the lid. In cases of inturned lashes rapid eversion followed after several punctures.

Dr. C. F. Jones reported a "Case of Traumatic Cataract with a Foreign Body in the Lens." The patient had been injured while opening a nailed box. The radiogram showed a foreign body in the temporal side of the lens and projecting into the vitreous. The foreign body was removed with a blunt magnet point. Later the lens was disced and curetted. The course was uneventful and in three months with correcting lens the vision equals 5/15.

BURTON CHANCE, M. D., Secretary.

SECTION ON OPHTHALMOLOGY, COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting March 19, 1908.

Dr. George C. Harlan, Chairman protem., presiding.

Tuberculosis of the Iris.

Dr. Wm. Campbell Posey exhibited a young colored man with tuberculous deposits in the anterior chambers of both eyes. The tuberculous mass in the right eye was unusually large, half filling the anterior chamber. A general reaction had been obtained by a 2 mg. dose of tuberculin. There were no other evidences of tuberculosis in the system.

Electric Burn of Eyes.

Dr. Wm. Sweet presented for Dr. Howard F. Hansell a "Case of Burn of Both Eyes by Electricity." The patient was a man, aged thirty-five years, the victim of an accident. While he was sawing an electric light cable, capable of carrying 500 volts, the current was suddenly turned on. A flash of light was emitted from the points of contact of the cable and saw, burning off eyebrows, eyelashes, and moustache, and scorching the entire face and both lids. Upon admission to the Jefferson Hospital, the skin of

the face was discolored a dark red and was edematous. The lids were distended by edema so that they could be separated with great difficulty. The conjunctivas were inflamed and the corneas opaque. For the first twenty-four hours ice compresses were used and afterward hot compresses were substituted. He was ordered atropine, holocaine, and carbolized vaseline. The epithelial layer of the cornea of each eye became necrosed and was discharged. The epithelium of the conjunctiva remained intact. The right eye recovered promptly, healing with only a superficial scar. The left partly recovered and relapsed several times, owing to the destruction of the corneal nerves and insensibility of the exposed surface. The treatment carried on at present consisted in the use of atropine and the constant wearing of a bandage over the left eye.

Pseudoglioma.

Dr. Edward A. Shumway exhibited a "Case of So-called Pseudoglioma" in a boy, aged fourteen years. No history of traumatism or infectious disease could be elicited. A connective tissue mass occupied the lower and inner part of the vitreous, from which delicate membranes could be followed to the upper part of the fundus. The choroid above showed fine pigmented lesions. Dr. Shumway spoke of the differential signs between pseudoglioma and tumor, and believed the condition to have been a non-suppurative infection of the uveal tract, due to an organism of comparatively low grade virulence.

Macular Homonymous Hemianopsia.

Dr. Wm. Campbell Posey reported a "Case of Right Homonymous Hemianopsia in the Macular Regions," occurring in a male, aged fifty-six years. The visual defect had occurred in an apoplexy which was unattended by other symptoms and had persisted without change for the four years the patient had been under observation. Central vision was normal in each eye and the peripheral fields of vision were also normal, the only loss in the fields being small triangular areas to the right side of fixation.

Dr. Posey said that he had been incited to report this case by a recent paper of Wilbrand, in which eight cases of this unusual loss in the fields of vision had been recorded, and after calling attention to the difficulty in reading which the defect occasioned, passed to the consideration of Wilbrand's negation of von Monakow's views of macular representation.

Wilbrand explained the lesion by a blocking of an end artery in the visual area of the cerebral cortex, although in one of his

cases the lesion was occasioned by the penetration of a screw in the region of the cuneus.

Dr. Posey referred to Mills' observation of two cases of macular hemianopsia ten years previously, and to this well-known authority's conclusions regarding the entire subject of macular cortical representation.

Muscle Palsies in Graves' Disease.

Dr. Posey reported in addition "Two Cases of Palsy of Extra-Ocular Muscles in Graves' Disease." Both patients were females, exhibiting other characteristic signs of the disease. The right superior rectus muscle was palsied in one case: both external recti, the left superior rectus, and inferior oblique muscles in the other. The writer referred to a previous paper by him upon the subject and said that palsies of the extra-ocular muscles in exophthalmic goitre were not extremely rare and were to be regarded not as accidental, but rather as a part of the morbid process of Graves' disease.

Interstitial Keratitis with Cretinoid Conditions.

Dr. Samuel D. Risley presented the histories of "Two Cases of Parenchymatous Keratitis" with somewhat unusual local and systemic symptoms. No signs of either hereditary or acquired syphilis could be traced with any plausibility. Persistent treatment by the usual well-known methods afforded no relief. The general symptom complex suggested a cretinoid or myxedematous complication. He then directed the general treatment to this systemic cachexia, continuing the same local measures which had before been used without result, and rapid improvement followed.

Dr. Pyle called attention to the fact that Dr. Risley's interesting cases furnished additional evidence to support the growing disposition to challenge the long-accepted dogma of Jonathan Hutchinson, that hereditary syphilis is almost invariably associated with interstitial keratitis. He was in thorough accord with the modern idea that any profound metabolic disturbance may produce organic disturbances analogous to those caused by inherited syphilis. Several European authorities go so far as to say that inherited tuberculosis or extreme tendency to tuberculous infection is more often associated with juvenile interstitial keratitis than is congenital syphilis. When at a loss for definite etiological data, too often is there a gratuitous assumption of hereditary syphilis. Many patients so classed would show much more rapid improvement under the modern advanced dietetic and hygienic treatment of

the American school of pediatrics than ordinarily follows the old-fashioned mercurial inunctions and continued administration of iodine compounds. Dr. Risley has offered an important thought in his suggestion of the necessity of thyroid treatment when there is disturbance of this gland, in addition to the therapeutic measures directed to the original underlying dyscrasia.

Dr. Jas. B. Neal said that in his practice and that of his colleagues in China many cases of interstitial keratitis were observed following attacks of acute diarrhea, which were common in the rainy season. Many were certainly not due to inherited syphilis. In these patients he obtained the best results by treatment first of the diarrhea, and then by administration of tonics, such as cod-liver oil, iodide of iron, and other remedies which would improve the general health.

Dr. Ziegler spoke of the increasing tendency to hunt carefully for possible perversions of metabolism in treating local inflammations, and of the great disturbance of the entire organism when the thyroid gland was not functioning properly. There was also a tendency to use thyroid extract even in disease not directly of thyroid origin, in order to encourage the re-establishment of the normal metabolism. He had been using it for two years past in cases of interstitial keratitis, whether of syphilitic origin or not, as they always responded more readily to this treatment. He had also found cases of subretinal hemorrhage were greatly improved by this treatment.

Dr. Zentmayer said that, notwithstanding our broadened etiology, he still believed that inherited syphilis was the principal cause of interstitial keratitis, as in his experience the number of cases of interstitial keratitis which showed the other stigmata of inherited syphilis—the notched incisors, rhagades, scaphoid face, and deafness—left but a small number to be divided among other possible causes.

Dr. Pyle said that these so-called associated stigmata of hereditary syphilis, to which Dr. Zentmayer had referred, may all be seen in cases of juvenile tuberculosis, and even in the lesser marasmic disturbances of general nutrition.

Dr. Shumway said that, in treating cases of interstitial keratitis, it was important to remember that not only the cornea, but the entire uveal tract, was usually involved, and as more and more cases of choroiditis were proved to be dependent upon disturbances of metabolism, with the production of auto-intoxications, the ophthalmologist should bear these facts in mind and hunt for similar

conditions in obscure cases of corneal disease. Examination of the urine may discover products of faulty elimination, and the correction of such faults will lead to a more rapid improvement of the local inflammation.

Dr. Risley emphasized, in closing, the opinion expressed in his paper that the same cause which produced the corneal disease in his cases had produced the impairment of the function of the thyroid gland, and referred to its now well-known influence over the general metabolism. The impairment of the thyroid function, therefore, however produced, reacted in turn upon both the general condition of the patient and the local manifestation in the cornea, thus establishing a vicious circle. Treatment with the thyroid extract, therefore, caused an immediate improvement when other remedies had failed.

Congenital Defect in the Choroid.

Dr. Reber exhibited a "Case of Probable Congenital Defect in the Choroid," occurring in a colored boy, aged twelve years, who was healthy in all respects and the subject of no congenital defects other than the one suspected in the eye ground.

There was a vague history of an injury to the eye three years before, by the premature ignition of some unconfined powder, which went off with a puff. The description given by the patient and his mother of ensuing inflammation indicated that there was nothing more than a slight burn of the anterior ocular structures.

The eye ground showed a normal nerve head. Situated in the macular region was a white area, a little larger than the disk, which looked much like piled up exudate; its surface seemed uneven and full of little hummocks, the whole area being elevated about 2 diopters. The retinal vessels traversed this area without any break, but seemed to rise up over its edge. A broad area (3 disk-diameters) adjoined the white area at its upper side and reached out temporalward 3 dds. farther, in white splotchings of a "pas-over bread" effect.

Far out in the temporal field, full 3 dds. beyond the white area alluded to, were 7 or 8 ampulliform dilatations of the retinal vessels, each one 2 to 3 times the width of a retinal vein. They all surrounded, more or less, a peculiar circular dilatation, $3\frac{1}{2}$ retinal veins in diameter, which had a darker hue than the others. Dr. Reber reviewed the different causes and conditions that might possibly account for this extraordinary picture, and by exclusion decided that it was, in all probability, a congenital picture.

It was pointed out that it might be either an atypical congenital defect in the choroid or the result of an intra-uterine inflammation, but the writer leaned toward the idea that it was a congenital defect.

Dr. Pyle referred to a recent paper read by him before the Section, which considered the etiology of intra-ocular colobomata and other congenital anomalies, and called attention to the fact that speculation as to preservation of the retinal elements was superfluous. If the retinal elements were absent, there would be found in the field of vision scotomata corresponding to the colobomatous area; if the retina was intact, there would be no such colobomata. For various reasons, Dr. Pyle was by no means convinced that Dr. Reber's case was one of congenital anomaly.

Dr. Posey said that while he disliked, from a single observation, to conflict the views of Dr. Reber, who had studied the case long and frequently, it did not seem to him that the condition could be properly designated a coloboma. A coloboma meant to him a defect and perhaps an ectasia in the eye, whereas in Dr. Reber's case the area in dispute seemed to him to be raised and more of the nature of a mass, the product of a proliferating retinitis. He had never seen a vascular condition similar to that observed in the fundus of the case under observation, and regarded it and the retinal mass as of probable congenital origin. Dr. Posey said that while it was true that observers had disclaimed that the fovea lay in the fetal fissure, there was embryonal evidence that it was connected with the fissure by a kind of accessory fissure. He pointed out that the fetal fissure was particularly prone to inflammation, both by reason of its richness in pigment and of the proximity of the retinal bloodvessels.

Dr. Ziegler agreed with Dr. Posey's statement that the use of the term coloboma implied the presence of an ectasia. Such a condition, however, was not present here, in his opinion. Measurement with the ophthalmoscope and the parallax at the edges of the lesion showed an elevation of at least 3 diopters. The vascular ampullae resemble cirroid aneurysms, but have no pulsation, and, therefore, could not be designated aneurysms. There is, however, undoubted evidence of subretinal hemorrhages with subsequent absorption and deposit of pigment. Possible compression of the head at delivery might account for all these lesions.

Dr. Risley had studied the ophthalmoscopic picture presented by Dr. Reber's patient with much interest. He did not think the

case was one of coloboma of the choroid. He could not determine any elevation or depression of the choroidal lesion. The appearance he thought was that of an atrophic patch following a choroidal hemorrhage or an attack of acute localized retinochoroiditis, which, in its acute stage, is occasionally accompanied by great edema and infiltration of the surrounding retina and choroid which obscures all details. After the infiltration has disappeared a choroidoretinal lesion, similar to that shown in this case comes into view. A few years ago he presented to the section the history of four such cases. The history of Dr. Reber's case he thought must of necessity be left to conjecture.

In closing the discussion Dr. Reber called attention to the fact that he had classed the case as one of probable congenital, circumscribed defect in the choroid, and it still seemed to him that this was the likeliest possibility. Such conditions were so rare, that it was wrong to dogmatize until we arrived at absolutely definite ideas as to where congenital defects leave off and the results of intra-uterine inflammation begin.

The Restoration of Contracted Sockets.

Dr. William Zentmayer read a paper on the *Restoration of Contracted Sockets*. One case had been successfully treated by the use of a Tiersch graft which had been spread upon a large glass sphere, such as is used in the Mules' operation, the epidermal surface was placed in contact with the glass and the globe so introduced that the graft was brought in apposition with the raw surface produced by dissecting out the cicatricial tissue.

The second case was operated upon after a method devised by Dr. Conrad Berens, of the Wills Hospital Staff. In this instance wearing of an artificial eye was prevented by two cicatricial bands which extended from near the margin of the upper lid back to the equator of the socket. Having selected the more extensive of the bands, it was grasped deeply by fixation forceps near one of its attachments, and with a stout curved needle a suture was carried beneath it. It was next seized in a like manner at the other end of its attachment and similarly transfixd by a suture. With a pair of straight scissors the band was then divided midway between the two sutures. This left two free opposed raw end surfaces with an intervening irregular raw bed surface. Grasping the ends of one of the sutures, the assistant seized the corresponding cut end of the band and raised it from its bed so that the suture could be tied across the face of its raw end, thus inverting

and tucking in the cut edges. The other suture was tied in a similar manner. The intervening raw surface was then covered in by bringing its edges together with a suture. One week later the second band was treated in a like manner. By slowly increasing the size of the artificial eye the patient is now able to wear one of moderate size. The surface of the socket is at present smooth.

Dr. Posey said that he had recently performed this operation on a case at the Wills Eye Hospital, and believed it to be especially adapted to cases in which the bands of adhesion were not too broad.

Dr. Harlan thought that the great difficulty in these cases is the absence of a conjunctival sulcus. If the cul-de-sac is not involved and a probe can be passed behind the contraction the case is comparatively easy to treat, but if the cicatricial contraction involves the cul-de-sac, the oftener an incision is made in it the greater is the subsequent contraction, which, in his experience, always forces out anything placed in the orbit to oppose it. He had attempted to establish a sulcus by inserting a stout lead wire, leaving it in position for several months until the sinus that it forms has dermatized, and then cutting down upon it and inserting a lead disk. In several bad cases he had succeeded admirably, particularly in one whose photograph he had shown to the Section a few years ago, but subsequently he had not been so successful. He was not quite convinced, however, that the principle was not a good one, and is waiting for a favorable case to make another trial. He had since learned that Hinly has proposed a similar treatment for total symblepharon.

Dr. Pyle expressed his interest in the ingenious operation described by Dr. Zentmayer, and was decided to try it at the first opportunity. However, he agreed with Dr. Posey that it would likely not be sufficient in cases with very thick bands of adhesion. In his experience with plastic conjunctival operations after enucleation, he had been impressed by two points: First, the great value of using analogous grafts from the buccal and oral mucous membrane. Second, the gratifying results following gradual and progressive stretching of the enucleation-cavity by lead-ball prosthesis. The size of the inserted balls is increased weekly during several months.

EDWARD A. SHUMWAY, M.D.,

Clerk of Section.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. K. Wessely has qualified as instructor in ophthalmology in Wurzburg.

Dr. Watson W. Gailey of Jacksonville, Ill., has removed to Bloomington, Ill.

Dr. James Allen Patterson of Colorado Springs, Colo., has returned from a month's tour in Old Mexico.

Geh. Prof. Dr. Hirschberg, of Berlin, has been made an honorary member of the St. Petersburg Ophthalmological Society.

Dr. Howard S. Straight, an oculist of Cleveland, Ohio, died recently in New York City after a prolonged illness, aged 50 years.

As a result of much recent agitation, the ports of entry into Mexico are now rigidly enforcing the exclusion of immigrants having trachoma.

Dr. Alexander Sterling of Atlanta, Ga., has been placed on the *Ophthalmoscope* (London) staff, representing the southern states of the United States.

Dr. J. A. Donovan, of Butte, Mont., read a very interesting paper entitled "Headache and Its Cure" at the recent meeting of the Montana State Medical Association.

Miss Clement L. Stephens, who died recently in New York City, bequeathed \$2,000 to the Society for the Relief of Destitute Blind and \$1,000 to the Manhattan Eye and Ear Infirmary.

The Société d'Ophthalmologie de Paris will have as its officers for 1908: President, de Lapersonne; vice-president, Pechin; treasurer, Dubois de Lavigner; secretaries, Monthus and Cantonnet.

Dr. Gustavus I. Hogue has returned to Milwaukee after a year in Europe, and is again associated with Dr. H. V. Würdemann. Dr. Hogue has been appointed assistant editor on the staff of *Ophthalmology*.

J. B. Lawford, Esq., F. R. C. S., of London, England, is coming to America to address the American Academy of Ophthalmology and Oto-Laryngology at its next annual meeting at Cleveland, August 27, 28 and 29, 1908.

Dr. Cola H. Peete, a leading ophthalmologist of Macon, Ga., oculist and aurist to the Macon Hospital, Georgia Academy for the Blind, and South Georgia Orphans' Home, died recently in Macon, after a long illness, aged 45 years.

Dr. F. M. Chisolm has leased the house, 816 Connecticut avenue, opposite the Rochambeau, Washington, where he and Dr. J. R. Winslow have their offices. Dr. Chisolm will continue his offices in Baltimore, being there on three days in the week.

Through the unremitting efforts of Dr. L. M. Gurley, the city council of Johnston, Pa., has appropriated \$2,500 to begin the examination of the eyes and ears of school children according to the plan by which the examinations are made systematically by the teachers.

Miss Blake said this afternoon she was well aware the adoption of the first suggestion her committee had made would mean a revolution in printing school books for New York schools, and she would not be surprised if publishers offered objections until they thoroughly understood the plan.

Dr. Louis J. Lauterbach of Philadelphia has been found guilty by the board of censors of the Medical Society of diverting to his private practice clinic patients from the Philadelphia Eye, Ear, Nose and Throat Institute, which is under his direction but is a state institution. Judgment will not be given until June.

"We noticed," she said, "many of the school books are printed on smooth coated paper upon which the light is reflected or dazzles, causing a severe strain on the eyes. So we decided to recommend to the board of education that no more text books be used which were printed on glazed paper. When we spoke to specialists about the matter they agreed with us."—*Chicago Tribune*.

The syndicate of French oculists is still carrying on its good work. They have recently advertised in the local papers at Amiens and Limoges exposing the so-called "Norwegian" and "American" oculists who were infesting these districts. One foreign oculist was convicted of practising in France and was fined, the syndicate waiving jail sentence. They have also succeeded in keeping the opticians within bounds.

Dr. Theodor Saemisch celebrated his fiftieth "Doktorjubiläum" in Bonn on May 15th last. He was honored by a large assembly of his former students, colleagues and friends and by many con-

gratulatory messages from all over the world. Professor Dr. Herman Kuhnt, now director of the University eye clinic in Bonn, arranged for a subscription for the purpose of placing a bust of Saemisch in the University eye clinic.

School inspection is being rapidly pushed in France. Recently Berard of Angoulême and Leprince of Bourges proposed the formation of an association of those school inspectors whose work it is to examine the eyes of the school children. Truc of Montpellier and Rollet of Lyon have signified their approval of the idea, which is to bring the members into closer touch and by mutual advice and assistance to carry on the work thoroughly and expeditiously.

After two years' close observation of public school pupils at work, Miss Katherine D. Blake, chairman of the committee of the Children's Welfare Association, who is the principal of the girls' department of the public school, and those associated with her, have formulated eleven suggestions for improving the conditions of light under which children in the public schools work. These recommendations, which are now being considered by the committee on by-laws and legislation of the board of education, have met with unqualified approval of a dozen of the leading oculists in New York.

This year's meeting of the *Heidelberger Ophthalmologische Gesellschaft* will be held on the 5th, 6th and 7th of August. The usual reception will be held at Prof. Leber's home at 6 p. m. on the 4th of August, followed at 8 p. m. by an informal assembly in the Stadtgarten. August 5th at 9 a. m. is the session in the university; at 2 p. m., demonstrations in the Physiolog Universitäts-Institute; August 6th at 9 a. m., session in the university; 12 m., business meeting of members; 3 p. m., second demonstration session; 4:30 p. m., various excursions, etc.; August 7th, 9 a. m., session in the university.

HINC ILLE LACRIMÆ.

[It is said that an antiseptic property has been discovered to exist in tears.]

Hearken, my friends, to the last therapeutical
 News, that may save you your medical fees:
 Listen, and drive from your tissue and cuticle
 Any attack of infectious disease:
 Learn how the mumps and the measles and scabies
 Straight from a lachrymal drop disappear:
 Chicken-pox, atrophy, fever and rabies—
 All of them run at the sight of a tear.

Had but the Greeks, in the days of Thucydides,
 Scented the use of a blubbering eye,
 Then they had lived in a slightly sore-lidded ease,
 Never lain down in their thousands to die;
 Then they had started to weep and to mop hurt eyes,
 And we had wanted Boccaccio's tales.

Germ's are concealed in a penny or halfpenny;
 Therefore at shops, when receiving your change,
 Shed on the coppers a tear, and escape any
 Perils of eczema, struma, or mange,
 Yes, and 'tis probable too that a germ 'll lie
 Hid in a hand-shake, a kiss, or a touch;
 Weep then when shaking the hand of a firm ally,
 Weep when you kiss your inveterate "Dutch."

Pollen brings fever that troubles your ocular
 Organs, and darkens their luminous ray;
 Weep then, however internally jocular,
 When you are looking on barley or hay;
 But, that the cure may not ruin your eye, oh, be
 Careful to shed but a modest amount;
 Lest, like the recklessly sorrowing Niobe,
 You should entirely dissolve to a fount.

—Punch.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|--|--|--|--|---|
| 9 A.M. | Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.G.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wippen (E.E.N.T.) | | A. G. Wippen (E.E.N.T.) | | A. G. Wippen (E.E.N.T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E.E.N.T.) M. H. Lebensohn (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Twinen (N.W.U.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) W. A. Fisher (E.E.N.T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. A. Fisher (E.E.N.T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) *Frank Allport (N.W.U.) | E. V. L. Brown (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) *Frank Allport (N.W.U.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) *Frank Allport (N.W.U.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P.&S.) | H. H. Brown (Ills. Med.) | *J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | Burton Hazeline (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.G.) |
| 4 P.M. | W. F. Coleman (P.G.) | C. W. Hawley (P.G.) | G. F. Suker (P.G.) | C. W. Hawley (P.G.) | W. F. Coleman (P.G.) | Brown Pusey (County) |

*Special operative eye clinics.

ABBREVIATIONS:

C. C. S.: Chicago Clinical School,
 519 W. Harrison Street.
 E. E. N. T.: Chicago Eye, Ear, Nose
 and Throat College, Washington and
 Franklin Streets.
 County: Cook County Hospital, W.
 Harrison and Honore Streets,
 Ills. Med.: Illinois Medical College,
 182 Washington Blvd.
 Inf.: Illinois Charitable Eye and Ear
 Infirmary, Peoria and Adams Streets.
 Poli.: Chicago Policlinic and Hospi-
 tal, 174 E. Chicago Avenue.
 P.G.: Post-Graduate Medical School
 of Chicago, 2409 Dearborn Street.
 N. W. U.: Northwestern University,
 2431 Dearborn Street.
 Rush: Rush Medical College, W.
 Harrison and Wood Streets.
 St. Luke's: St. Luke's Hospital, 1416
 Indiana Avenue.

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII

CHICAGO, JULY, 1908

NO. 7, NEW SERIES

A NEW TRIAL CASE.

THOMAS M. STEWART, M. D.

*Professor of Ophthalmology, Pulte Medical College, Cincinnati
Ohio.*

The examination of the eyes "for glasses" consumes a large portion of the oculist's time, because of the number of cases and because some of them present more than the ordinary difficulties. To save time and to overcome difficulties has lead to the invention of instruments for the objective examination of the eyes and their muscles. Too much reliance on such instruments has not been conducive to that degree of satisfaction which patients expect.

These points have been so often forced upon my attention that a consideration of them seemed necessary.

Taking, then, a series of cases coming to me from recent refractive work by other oculists, and comparing the results with as nearly similar cases of my own, and going back to the time when I did not use the ophthalmometer for another series of comparisons, I determined that my individual results were better in proportion as I used the trial case, and checked the findings by the retinoscope. I also found that, in cases coming to me, dissatisfied with another's work, the trouble seemed to be due to faulty correction based upon ophthalmometric readings.

The case contains:

1. Sphericals, forty-four pairs each, of plus and minus, running by eighths from 0.12 D to 2. D; by quarters from 2. d to 5. D; by halves from 5. D to 9. D, and by whole dioptres from 9. D to 14. D, and then a 16. D, 18. D and a 20. D.

2. Cylinders, thirty-one pairs each, of plus and minus, running by eights from 0.12 D to 2. D; by quarters from 2. D, to 5. D, and by whole dioptres from 6. D, to 8. D.

3. The rims of the plus lenses are non-tarnishable, and the minus are gold-plated.

4. The axis of each cylinder is marked by a scratch line and by a hole drilled half-way through the glass, and then filled with white cement. This was done to do away with the confusion (to patients) caused by the ground glass strip on each side of the old

cylindrical lens, and to furnish a mark that could be at once detected as indicating the axes of the glass.



5. Prisms, nineteen pairs, one pair each of from $\frac{1}{2}$ to 4 centrad, single prisms on up to 20 centrad. Examination of muscle power are made with these prisms, instead of any one of the various devices more or less expensive; and by checking with the phorometer, my findings are equally as accurate and far more satisfactory upon which to base the line of treatment. The principles of prism refraction once thoroughly understood make it possible to quickly and accurately work out muscle problems. Comparative tests with a battery of prisms, in pairs from one to twenty, almost invariably will enable a patient to fuse more prism than his real muscle power will admit. The interrupted test with gradually increasing prism strength, shows the "lifting" power of the muscle being tested, without the chance of a false conclusion due to the

"facility" of fusing that comes with the gradually increased prism power common to instruments devised to facilitate the examination.

6. Crossed cylinders, a most important addition to the trial case are the three cross cylinders: because after any or all refracting methods have been used to work out the refraction, we make the final appeal to the trial case. Too much cylinder is often put on by ophthalmometric tests. The retinoscope at times indicates astigmatism when no cylinder is accepted by the patient. Trial case examinations often show too much sphere. To eliminate these errors, Jackson devised the cross cylinder, but no trial case has been, to my knowledge, equipped with them. They enable one to find the required cylinder when astigmatism is present.

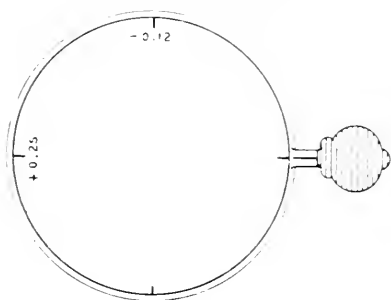


Fig. 2.

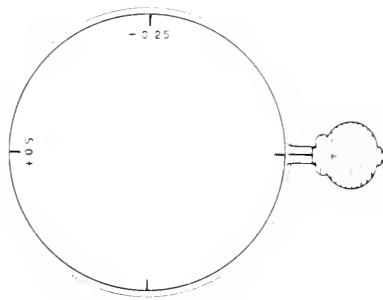


Fig. 3.

In this case herein described, three cross-cylinders are included: -0.12 sph. $\odot -0.25$ cyl.: -0.25 sph. $\odot +0.5$ cyl.: -0.5 sph. $\odot +1$ cyl. These are therefore equivalent to a pair of 0.12 , 0.25 and 0.5 cylinders, one plus the other minus, and placed at right angle to each other. The 0.25 cylinder is most useful, the stronger combination being used when the astigmatism is of high degree, and the 0.12 when it is less than 0.25 dioptre.

After the approximate correction is made, first determine if no change is required in the sphere, by the use of the "handled" lenses, which carries on three branches—a plano, a -0.5 and a $+0.5$ spherical, respectively. Weaker combinations may also be used to advantage.

The crossed cylinder is then used to determine which of two positions is the better: no improvement of vision is expected in this test. If the plus axis of the cross-cylinder coincides with plus axis of the correcting cylinder, the rule is to increase the cylinder and diminish the sphere. If the minus axis coincides with the plus axis of the correcting lenses, the rule is to increase the sphere and diminish the cylinder.

Hence, axes of the same denomination coinciding, call for an increase of cylinder and a decrease of sphere. Axes of unlike denomination coinciding call for decrease of cylinder and increase of sphere.

A re-examination after making any change called for by the cross-cylinder test will determine if the patient detects no further change in either position; and plus and minus sphere show no improvements. The axis should always be retested after correcting from cross-cylinder tests.

7. Three pairs of bifocals, + 1. D, + 2. D, and + 3. D, cemented to planos, are often useful in making reading corrections in those who have used bifocals, as well as demonstrating their advantage as compared with their disadvantages.

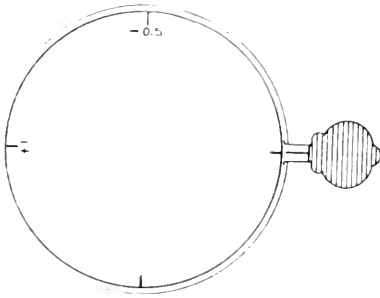


Fig. 4.



Fig. 5.

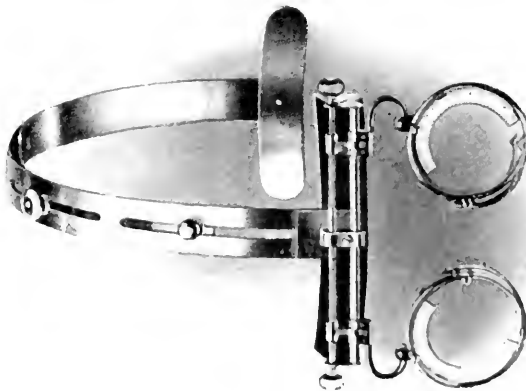


Fig. 6.

8. All the shades of smoked and medium shade of amber planos are given a place in the new trial case.

9. Besides the foregoing, a Thorington Axinometer, chromatic tests, a Maddox double prism, and the usual colored planos, stenopaic slits and holes. The case is leather lined, noiseless as plush and as dustless as wood.

10. The California trial frame, together with a light frame of ordinary style, have advantages appreciated only by a careful worker in refraction. This frame is so made that the adjustments of each cell can be made independently of the other, and has a place for three lenses. In muscle work and in retinoscopy, these few of its many advantages are sufficient to make it almost indispensable.

The specifications were filled by L. M. Prince, optician, Cincinnati, with careful attention to numbering and centering the lenses, and marking the cylindrical axes.

EXOPHTHALMOS OF THREE YEARS' DURATION CURED BY REMOVAL OF THE MIDDLE TURBINATED BODY.

RICHARD H. JOHNSTON, M. D.

BALTIMORE.

In November, 1904, Miss McK., 17 years old, was referred to me for nasal examination by Dr. H. Harlan who had found no orbital cause for a pronounced exophthalmos of three years' duration. When the eye began to project, her parents took her to an ophthalmologist, who, unable to find a cause for the trouble, sent her to a rhinologist for examination of the accessory cavities. The latter found nothing. The patient later consulted another ophthalmologist who acknowledged his inability to diagnose her case. The history was interesting in that it seemed to point to some trouble in the nose. Whenever an acute coryza developed, the exophthalmos was always more pronounced and with the subsidence of the "cold," the eye receded to its former position but was never entirely normal like its fellow. In September, 1907, the patient contracted a severe "cold" which disappeared within a reasonable time, but the eye which, as usual became markedly exophthalmic, did not recede to its former position but, on the contrary, grew gradually worse. When she consulted Dr. Harlan, exophthalmos was so marked that all movements were practically abolished. Vision was not affected. Careful external examination failed to show any deformity over the frontal sinus or ethmoid cells. Percussion caused slight pain over the frontal sinus while

the ethmoid region appeared normal to repeated taps. There had never been headaches and a purulent discharge from the nostril was denied. Intranasal examination showed a large middle turbinate, but no pus either before or after the application of cocaine and adrenalin. Transillumination was not tried since the tenderness over the sinus seemed to point to that cavity as the seat of the disease. I advised removal of the anterior end of the middle turbinate body to facilitate drainage and treatment of the frontal sinus. Operation was accepted and the turbinate was immediately removed with Luc's forceps. There was a gush of about a half ounce of greenish, foul-smelling pus followed by a decided recession of the eyeball. After the operation no pus was found in the nostril. In a week all tenderness had disappeared from the frontal sinus. The exophthalmos gradually decreased and in about six weeks the eye was normal. Since the recovery the patient has passed through two "colds" but the eye has remained perfectly normal.

919 North Charles street.

SOME ETIOLOGIC FACTORS IN INTERSTITIAL KERATITIS.*

By SAMUEL D. RISLEY, M. D.

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There is probably no fact in the history of medicine which presents a greater tribute to the value of inductive reasoning than the universal recognition by medical men of the accuracy of the observations of Johnathan Hutchinson regarding the very frequent association of parenchymatous keratitis with the egged and notched central incisors and other manifestations of inherited syphilis. But this observation so signally true, and which has added luster to his name, has in some measure, I believe, prevented the due recognition of other, and still obscure etiologic factors, not only in interstitial keratitis, but in many other manifestations of disease often associated with this dyscrasia.

It is probably true that inherited syphilis is responsible for a large majority of the cases of interstitial keratitis, but while forced by our clinical experience to recognize this fact we should bear in mind that a considerable group of affections, which for the sake of brevity we may designate *the diseases of nutrition*, are fre-

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quently responsible for this form of corneal disease. Indeed, I believe it is probable that, even in a considerable percentage of cases where inherited syphilis in the second and third generations can be traced with much plausibility, the corneal disease is only one of the incidental manifestations of the faulty general metabolism and impaired vitality resulting from a vicious inheritance. In a word that, given the impaired metabolism, whether from inherited or acquired syphilis or other cachexia, or produced by faulty living, the form of corneal disease under discussion may be only one of the local expressions of the general disorder.

This view finds corroboration in the necessity, shown in our daily clinical experience, for methods of treatment which first secure a reformation in the general nutrition of the patient before any improvement in the ocular disease is observed.

I present as briefly as possible, the history of two somewhat unusual cases of interstitial keratitis, in neither of whom could signs of inherited syphilis be discovered after the most careful scrutiny in the search for stigmata, but both of whom were nevertheless victims of some serious morbid state.

Case 1.—T. K., aged 20. Railroad employe, came to the Wills Eye Hospital May 28, 1907, with interstitial keratitis, confined to the right eye. He had been under careful and well directed treatment by Dr. T. E. Teah of Renova, Pennsylvania, for six weeks, but the eye had grown steadily worse in spite of the efforts of his physician. He was therefore sent for admission to the hospital with a request for an opinion as to the unusual nature of the affection. As all the accredited methods of treatment, both general and local, had been employed unsuccessfully it was obvious that either new methods should be adopted or the old continued under hospital environment with greater perseverance.

The right eye had only quantitative perception of light. There was marked photophobia and constant headache. The eyelids on both sides were not red but seemed thick and in addition to the spastic closure, due to the dread of light, seemed to hang sluggishly and heavily over the eyes. The cornea of the right eye was a uniform bright pinkish-red color throughout and so completely opaque that even a strong oblique pencil of light gave no suggestion of iris or pupil through it.

When studied in strong light with the loup the color was seen to be due to innumerable blood vessels coursing in the substance of the cornea, too fine to be resolved by the unaided eye. The tension of the ball was diminished and the cornea gave the im-

pression of being soft and doughy. Under pressure of the heavy lids it had assumed a wave-like form, the crest of the wave corresponding to the opening between the lids. The corneal epithelium was intact, the surface being smooth and reflecting. The condition of the man was so pitiable and the prognosis apparently so hopeless that a colleague advised immediate enucleation of the eye.

The young man, although but twenty years of age had been a miner and miner's helper in the coal fields of Pennsylvania, but for the past two years had been employed as a common laborer in a railroad yard and subjected to the exposure and irregular living of such employment at an age too young to endure with impunity its hardships.

His general condition was interesting and not usual. He was stocky, about five feet six inches in height, had an abundance of light-colored, dry, crisp hair, an apparently heavy jaw with large well-formed perfect teeth. His lips were thick and heavy and at times presented a pinkish purple tint; the tongue appeared too large for his mouth, was pale, coated and deeply indented by the teeth. The soft palate was thick and seemed to hang like a rigid curtain or arch before the pharynx. The skin of the face and neck was opaque, appeared the color of old ivory, was not oedematous, but his flesh felt hard and unduly resisting to the touch. The hands were stubby, the palms dry and rough, the finger ends clubbed and the finger nails thick, dry and cracked, the ends being rolled inward like claws, but lying closely in contact with the clubbed fingers. His voice was muffled, his speech deliberate and hesitating, which may have been partly due to his thick and stiff palate, large tongue, the thick and dry lips, but was doubtless in part occasioned by his mental condition. It seemed to take an appreciable time for an adequate apprehension of a question addressed to him. He disliked to stand, so that in the clinic room he would fall into the nearest seat as though fatigued. He walked in an awkward manner, somewhat like a sailor on land after a long stormy voyage at sea. His face and its separate features seemed too large. There was no tachycardia or exophthalmos, and no visible enlargement or apparent diminution in the thyroids, but they seemed unusually resisting to palpation. The man was taciturn, discouraged, and sad; was at time irritable, but responded promptly to kindness or attention. The temperature was normal; there was no albuminuria, but the specific gravity of the urine was high. He was constipated.

He was placed on iodide of iron and arsenic internally, atropia

and dionin locally, alternating with subconjunctival salt injections and hot stupes, but without appreciable benefit. The treatment, except the atropia, was stopped after ten days and he was placed upon pulv. thyroid gland of the sheep, gr. iii. three times daily, and was allowed the freedom of the ward. I have but rarely seen such results follow any therapeutic measure as were speedily manifested in this man. In less than a week his personality underwent a marked transformation.

At my second visit to the hospital, four days after beginning the thyroid medication, he came to the clinic room when summoned by the ward bell with a quick and buoyant step, a smile on his face, the photophobia gone, his eyes as wide open as his thickened lids permitted and with a manner totally unlike the man I had first seen. Without questioning he promptly volunteered the information that he was "lots better" and "felt good." The thyroid was continued and subconjunctival salt injections again administered on alternate days, followed by a hot salt stupe.

His improvement was rapid and continuous. The awkward sailor-like movements, the general malaise, the heavy eyelids, enlarged ears and thick lips, the swollen and pale tongue, the fixed arch of the palate and his enlarged hard and ivory-like face all gave place to normal conditions, while his taciturnity and moroseness changed to a cheerful helpfulness to other patients in the wards of the hospital. The red cornea changed rapidly to a general or uniform grayness, which in turn gradually broke into nebulous clouds with relatively transparent interspaces as improvement advanced. The pupil could now be seen through the nebulous cornea and was found widely dilated and no evidence of marked uveal disease could be discovered. Vision rose to 1/10 when he left the hospital for his home on July 1th, six weeks after his admission to the wards. The left eye then showed no external evidence of disease. Unfortunately no study of the fundus was made. He carried a letter to Dr. Teah telling of the treatment under which the rapid improvement had occurred.

The man returned to the hospital February 19, 1908, with an attack of interstitial keratitis in the left eye. He was unable to count fingers. There was some deep ciliary injection, a central nebula, but no bloodvessels in the cornea. There was no evidence other than slight ciliary injection, of involvement of the uveal tract. He said that when the attack began in this eye his physician had prescribed thyroid extract, but that it made him feel so badly he could not take it. There was no relapse into the

unusual general conditions which had been so marked a feature of his disease. Atropia and salt injections were prescribed locally, iodide of iron and arsenic internally, but the eye grew steadily worse until the cornea became vascular, the bloodvessels approaching the pole, first from the lower limbus, then from elsewhere, but never became so numerous as during the attack in the right eye, nor was the corneal opacity so dense as in the first eye. In a word the interstitial keratitis presented only the usual characteristic appearance and history.

The thyroid extract was not well borne and did no good. He then received bichloride of mercury and muriate of ammonia internally under which the progress of the disease was apparently arrested and he was discharged from the wards to be treated as an out-door patient. His progress since has been rapid under the usual methods of treatment.

Case 2.—While Case 1 was under treatment at the Wills Eye Hospital, Olive T., a child, aged nine years, was sent to my office by Dr. Seibert of Bellefonte, Pa., on November 6, 1907. The right eye showed deep ciliary injection and a gray nebulous, parenchymatous opacity in the lower temporal portion of the cornea, but without visible vascularity. The cornea of the left eye was vascular throughout, gray-white, but with intact epithelium. The opacity was so dense that no view of iris or pupil could be had with oblique light. The profuse lachrymation, intense photophobia and orbicular spasm were notable local symptoms, not usually present in so marked a degree in interstitial keratitis. The only discoverable significant fact in her medical history was a prolonged period of inanition produced by entero-colitis during infancy. The child appeared much older than nine years: was dull, sad featured and irritable, stubby and awkward in her movements. Her attendant said she was always tired, slept much in daytime and when awake complained of headache. For the preceding three months she had had night terrors and had to have her limbs rubbed every night to keep them from going to sleep: her father said to promote circulation. Her appetite was good. The face was large and presented the peculiar pallor of old discolored ivory and her flesh of face, arms and legs was hard, but did not pit on firm pressure, although the appearance was somewhat like that of tense edema. There was no albuminuria and no heart murmurs could be discovered, but the pulsations though rythmical were slow and deliberate, probably between 50 and 60 beats per minute, but increased in frequency under treatment or any exciting cause.

The thyroid glands were not notably enlarged but seemed hard to palpation. The tongue was large, pallid and indented by the teeth, which were good and apparently normal for her age. She was placed on atropia locally, and subconjunctival salt injections on alternate days in both eyes. Internally iodide of iron and arsenic. This treatment was continued until November 23. The corneal conditions in the left eye, doubtfully improved, but the right eye steadily grew worse. The cornea became vascular, the opacity spread and grew more dense. The salt injections were then omitted and a 2 per cent solution of dionin instilled twice daily which after a week was increased to a 5 per cent solution. There was, however, no notable improvement. For a few days she would at times be more comfortable only to lapse into her former condition, the general trend being downward. The local conditions for a while seemed to benefit from insufflations of calomel. Quinine, the compound syrup of hypophosphites and other drugs were tried persistently without favorable result. The child grew more and more sad, irritable and homesick. The only beneficial result of treatment was the diminished vascularity of the left cornea, but the opacity remained almost white.

On December 29th after seven weeks of persistent treatment all other internal medication was stopped and she was given gr. iii. three times daily of pulverized thyroid gland of the sheep. On January 9th the extreme photophobia and lachrymation had ceased and the child was obviously more comfortable. On January 22d. the distressing dread of light and lachrymation had quite disappeared. The right cornea had cleared rapidly so that the child could count fingers readily and the iris and pupil could be plainly seen while in the left the almost leucomatous opacity had faded to gray and the pupil could be seen dimly through it. The dionin had been steadily continued and occasional subconjunctival salt injections given. Late in February the thyroid tablets made her feel badly and her attendant thought increased her nervousness and irritability. The dose was then diminished and finally omitted on alternate weeks and she received three-drop doses of Burnham's soluble iodine, given before meals for the intervening weeks. On March 27th she returned to her home, seeing her way about, able to enjoy pictures in magazines on the office table and was bright, happy and cheerful. On May 9th the child was apparently normal except for the remaining grayness in the left cornea which was steadily diminishing and she begged for permission to join her companions at school, which was granted.

It is obvious that the special interest in these cases of corneal disease clusters about the myxedematous symptoms and the very rapid improvement in both general and local conditions which followed the administration of the thyroid gland. There was no plausible reason for suspecting hereditary or acquired syphilis in either of these patients, except the occurrence of the keratitis. Mercurials failed to give favorable response in either of these patients except in the attack on the second eye in Case 1. It is not claimed that either case can be regarded as a typical example of myxedema or of cretinism, but that they presented well marked myxedematous symptoms can hardly be questioned, certainly in the light afforded by the therapeutic test. Both cases were obviously the victims of some cachexia as displayed by the peculiar pallor of the skin, the general weakness, the torpor of the mind and all the other faculties.

The general dropsical appearance, the hardness of the flesh to palpation and the absence of pitting and of albuminuria recalls the definition of Ord for myxedema, viz.: "A progressive disease in which the tissues of the body are invaded by a mucus yielding dropsy, unaccompanied by albuminuria or other symptoms of renal disease."

The opacity of the cornea in both of these cases differed in appearance from any other case I have seen. It was peculiarly dense and lacking in translucency. No suggestion of iris or pupil could be secured through it, even when the light from an electric globe was condensed upon the cornea with a lens. Was this opacity due to the mucine infiltration or whatever it may be which characterizes the infiltration of the tissues in myxedema? One is inclined to answer this inquiry affirmatively, not only because of the improvement under thyroid gland medication, but from the rapid and unusually complete disappearance of the corneal infiltration. In my own experience with interstitial keratitis, where the opacity has been dense and vascular, the remaining nebulosity, even in quite successful recoveries, has been considerable even after many years. It is much less in these patients than is usual at a corresponding period in the convalescence. Corneal disease is not a common occurrence in myxedema. The only reported case which has come under my notice is one by Treacher Collins reported to the Ophthalmological Society of the United Kingdom in 1907, which cleared up rapidly under the administration of thyroid extract. *Trans.* Vol. xxvii, page 17, "Corneal changes in a case of myxedema." Whatever may have been the origin and essential

nature of the affection in these striking and peculiar examples of disease it is clear that the ocular conditions were but one of the localized results of a general disorder. Reasoning, *a priori*, it is not probable that the baneful influence of some obvious impairment of the ultimate process of nutrition would fall upon the eyes alone. To conceive this as probable would be like regarding the impaired function of the kidneys as the *fons et origo* of all the manifestations of disease in cases of commencing sclerosis of the general vascular tree, whereas in a large group of cases the disease of the kidneys is but a part of the general disaster that has befallen the entire organism. So in the two cases which have furnished the text for this discussion, I do not believe that either the affection of the eyes or of the thyroid gland are to be regarded as the primary disease, but the underlying dyscrasia, the evil influence of which fell upon both alike. Nor do I believe that it is of primary importance to discover the specific nature of the morbid state.

The causes which may sap the vitality of the individual are numerous. They may be congenital or acquired after birth. For illustration the following enumeration is significant: The children of a young mother who has not reached physiologic maturity; or of parents who have passed the physiologic zenith; or where the father or mother, one or both are, from many conceivable causes, temporarily or permanently unfit, but nevertheless not subjects of any hereditary or acquired specific taint. Children with such parentage start in life with a modicum of vitality insufficient to resist the stress and strain of adverse fortune. To this group are to be added the unfortunate progeny of a tainted parentage, who start in life with sapped vitality and therefore are unable in varying degrees, to antagonize the hostile influences which assail all alike. They manifest a tendency, in common with the first group, to disease, to pathologic processes. It is possible, if we may employ the modern laboratory phraseology, that their opsonic index is low. In all such individuals the avascular structures of the body, of which the cornea is a striking example are especially prone to disease, of which parenchymatous keratitis is a type. To these which may be called the hereditary groups must be added a large group of patients in whom the vitality has been lowered or overthrown by acquired diseases of the infectious type, as for example, syphilis, tuberculosis, gonorrhea, and the exanthemata.

Again overwork and worry, the misfortunes of life, the untoward circumstances of the poor or living under bad hygienic environments, may all tend to sap the resisting power of the

organism and so favor the establishment of localized disease of low inflammatory type in these relatively badly nourished avascular structures. Diffuse parenchymatous keratitis is a characteristic example. In the hereditary group we more frequently find the typical picture of interstitial keratitis often associated with affections of the joints. In the acquired cachectic state there is greater liability to disease of the uveal or vascular tract with a secondary involvement of the avascular structures of the eye, viz., the vitreous, lens and cornea.

Research has shown the signal importance of not only the thyroid but the other ductless glands in maintaining the normal metabolism. If these glands have suffered impairment in common with other parts of the general organism, it is not reasonable to expect that any definitely localized disease or the general disorder can be removed by the usual remedial measures until their important functions have been restored. In this view I believe we have the explanation of the speedy recovery of these patients under the administration of the thyroid gland.

It is interesting, however, to inquire into the nature of the cachexia in these two patients. In the young man, the life history seems to point only to the hardships and faulty living to which he had been subjected during the years of physiologic growth. His parents were poor but are living and vigorous, healthy people. His brothers and sisters he said were well and strong. He had never had gonorrhea or syphilis, and showed no evidence of any inherited disease. His health, that is to say his metabolism, his nutritive processes seem to have been simply overwhelmed by exposure, too hard work for his age, bad or improper food, at irregular hours and sleeping where and when he could.

The medical history of the child pointed only to a feeble childhood following a long spell of inanition due to entero-colitis in infancy. In this was probably laid the foundation of her impaired functions, which, simply as a part only of the pathologic history of her life, when seen by me, had attacked not only the eyes but also the thyroid gland impairing its functions and rendering all remedial measures futile until its influence had been replaced or restored by the administration of the thyroid of the sheep.

If this induction is correct the conclusion is of signal importance since it gives us a deeper insight into nature's methods in both health and disease; a more profound concept of many pathologic processes and prepares the way for a more rational therapeutics.

A CASE OF CONGENITAL ANIRIDIA, ALSO ONE OF KERATO-CONUS.

BY DR. GEORGE ROBINSON.

PHILADELPHIA, PA.

Congenital aniridia is illustrated in the case of this little girl by a complete absence of the iris. Since birth she has manifested marked photophobia and lachrymation. Local illumination fails to reveal any portion of the iris, although in these cases the microscope shows it is present to a rudimentary degree. The lens is clear but dislocated upward and will probably become cataractous. Refraction failed to improve her vision.

This young man presents the conical cornea of noninflammatory type. There is no history of disease or injury, his vision failing suddenly fourteen years ago. The front of his eye has an unusual luster, the cornea is marked cone-shaped, the apex being located downward and inward. There is a faint apical haze which is occasionally met with in old cases. His vision is reduced to fingers at two feet. With the aid of the stenopaic slit and pinhole disc, he selects a minus 6 D. cylinder= $20'$ cc. Some hereditary dyscrasia is the generally accepted cause and calls for appropriate medicinal treatment. Opaque discs and pigment to be worn upon the correcting lenses may improve vision.

Operative measures are successful in lowering the height of the cone, but are attended with considerable risk.

ABSTRACT OF DR. FREELAND FERGUS' PAPER.

The author first referred to the operations by sutures and ligatures, as illustrated by the operations of Mules, Harman, and Worth. Attempts had also been made at advancement, as in his own method of advancement of the occipito-frontalis, and to attach a portion of the superior rectus muscle to the upper eyelid. Others had tried to advance the levator palpebrae superioris. Finally, there was the plastic operation as in the well known operation of Panas. The suture operations seemed in their essence bad: a thread which was absolutely sterile would not cause cicatricial contraction. Moreover, threads left projecting on the skin sur-

face were apt to be channels of septic invasion. Ligature operations left the lid without much mobility, and success depended on the permanency of the metallic or tendinous suture. Of the advancement operations, he was satisfied with that of the occipitofrontalis. Recently, however, he had used a much larger incision than formerly. He now made an incision right along the eyebrow, and then continued it for $1\frac{1}{2}$ to 2 inches upwards and outwards, so that he could reflect the skin very thoroughly. Where asepsis was secured, the patient was not disfigured with a scar in after life. In many cases of ptosis, the levator palpebrae superioris did not seem to be developed at all. The eyeball was protected either by a Knapp's lid clamp, or by an ordinary metal spatula. A skin incision was made parallel with the edge of the eyelid and across its entire extent. It was situated a few mm. above the free border of the lid. Another incision began at one end of the primary incision, curved upwards over the eyelid, and downward, so as to terminate at the other end of the incision. The portion of skin thus isolated was then dissected up, and the tissue down to the conjunctiva removed. One set of sutures was placed deeply, consisting of one point in the middle, and one at either side. Superficial skin sutures were also inserted. For the deep sutures he used Van Hoorn's .00 gut. That operation lifted the eyelid easily to the required amount, and put it completely under the control of the occipitofrontalis muscle. Dr. Fergus showed a number of photographs of cases so treated, with excellent results.

Reports of Societies

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The ordinary meeting of the society was held at the Medical Society's room on Thursday, May 7, 1908.

Mr. Marcus Gunn, F. R. C. S., president, in the chair.

Mr. E. E. Henderson showed microscopical sections from the case of orbital growth shown at the last meeting. Mr. Edridge Green exhibited and demonstrated a lantern of an economical design for testing color perception. Mr. Devereux Marshall highly approved of the lantern, which he understood would cost only 25 shillings, as against about six guineas for the more elaborate lantern of Dr. Edridge Green. Mr. Nettleship said he had used Priestley Smith's lamp and found it very useful, patients making very few mistakes. The president said he had had a lamp in use for 15 years, with ordinary red and green glasses, and an opaque ground glass, with a diaphragm. Dr. Clement Hailes showed a portable illuminative attachment for the ophthalmoscope, which could also be used as a focal light. It was attached to a small accumulator which could be carried in the pocket, leaving the hands free. Mr. J. H. Tomlinson showed a Nernst lamp projecting lantern for the consulting room, also a small Nernst lamp in which the resistance was in the handle. Mr. Jessop showed a case of aniridia of both eyes. Mr. George Mackay, Mr. Treacher Collins, and Mr. Devereaux Marshall described similar cases. Mr. Jessop showed a boy, aet. 9½, with glioma. Mr. Freeland Fergus read a paper entitled "Ptosis Operations" (see separate abstract). Mr. Priestley Smith thought the question of most importance was what happened during sleep in cases which had been operated on: there might be considerable gaping of the lids. Mr. Roll thought quite as good results were obtained from Hess' operation as Mr. Fergus got by his method. Mr. Marshall thought that during sleep the eyeball rolled upwards, and that therefore the cornea would then be covered in any case. Mr. Fergus replied. He said he did the first operation 12 years ago, and he had not yet seen corneal trouble. He believed that closure of the eyelid during sleep was involuntary. If he should encounter a case of ulceration of the cornea following the operation he would consider it his duty to report it to the society.

Messrs. E. Clarke and S. Mayou read a paper on Tubercle of

the Iris treated by Tuberculin. In the case there was a large area of detached retina, forming a whitish prominence on the nasal side of the disc, 3 D, at the highest point, and crossing below the large inferior retinal vein. The retina in the upper part was covered with an exudate. There was no history of tubercle or syphilis in the case. The vision was 9/18, the vitreous full of opacities, and there was a mass of k. p. spots in the lower part of Descemet's membrane. A tumor was very distinctly seen, and as a result of a consultation with one or two colleagues, it was decided to ask Sir Almoth Wright to treat the case by tuberculin. That was done, and six months after commencing the treatment, improvement set in: vision increased, and the k. p. spots disappeared, and the growth became flatter. The treatment was continued for a year, during which 21 inoculations were given, and the result was to drive the tubercle out of the system. The eye was now practically normal. Mr. Clarke next read a paper on "Confluent or Conglomerate Tubercle of the Iris treated by Tuberculin." Except for hyd. cum crete every night for a week on admission, and cod liver oil, no other treatment was given. After needling, which he proposed to do later, the case was a complete success. The cases were discussed by the president, Mr. Jessop, Mr. Herbert Fisher, Mr. Sidney Stephenson, Mr. Bishop Harman, Mr. Fergus, Mr. Johnson Taylor, and Mr. Cruise. Mr. Clarke, in his reply, said the mercury was given as he wanted to have a second string to his bow and avoid wasting precious time. He did not use Calmette's reaction, as he knew of a case in which inflammation of the eye had persisted for some weeks after its use. Dr. George Mackay (Edinburgh) read a paper entitled "Note on a Case of Arterio-Venous Aneurism Treated by Ligature of the Common Carotid Artery." The author reported the result of a case shown by him at the Edinburgh meeting of the society last year. The exophthalmos had now entirely disappeared, the bruit was no longer heard, and the vision now practically 6/18 in each eye. A month after the carotid had been tied, and while the patient was still in hospital, he developed thrombosis of the left leg and thigh, but he made a good recovery from that and was discharged on August 2d, and had since resumed his work as a coachman. Early last month he came to see whether anything could be done to remedy the convergent strabismus which remained as a result of the paralysis of the right external rectus. The power of that muscle also had improved considerably, and Dr. Paterson tenotomised the internal rectus, leaving only 5 degrees of convergence. He also

read a paper on a case of phlyctenular keratitis and pustular episcleritis treated by antistaphylococcic injections. The patient at the age of 14 had keratitis in the left eye, with considerable impairment of vision, and five years later the other eye was affected, and she was under the care of Dr. Dufour of Lausanne. His treatment was by hot fomentations, and anti-rheumatic powders internally. Shortly afterwards she consulted Dr. Mackay, and he found a small pustule on the right conjunctiva, which had discharged its contents and appeared as a raised ulcer. There was a haze in the cornea and a thinning in the ciliary region, but no pain. Hypermetropic astigmatism was present in both eyes, but she had not worn glasses. He ordered weak yellow oxide of mercury ointment, with atropine, and gray powder and bicarbonate of soda internally, followed by an arsenic and iron tonic. Under this she gradually improved, and correcting glasses were ordered. Three years later she returned with a small patch of injection in the edge of the right cornea, and there was a fringe of older opacity in the position of the arcus senilis. The same treatment again produced improvement. Subsequently there were several recurrences, and in August, 1906, he suspected the cause was tubercle, especially as her parents had been related before marriage, and she had some phthisical relations. Dr. Ian Stewart, at his request, took the opsonic index, and was found to be for tubercle 0.74, and for staphylococcus aureus, 1.24. Films from the conjunctival sac showed large numbers of polymorphonuclear leucocytes, and a few staphylococci, but no tubercle bacilli. Dr. Stewart thought the condition was not tubercular. After a week, antistaphylococcic treatment was started, 1.55 mg. of dried staphylococcus aureus being given dissolved in 1 cc. of distilled water. The following day there was a decided negative phase, the index falling to .92, but 24 hours later it had risen to 1.86. Steady improvement set in, and in January this year she said she was very well and had kept so. The general aspect of her eye was much improved. He proceeded to discuss the etiology of the episcleritis, and to bear testimony to the great value of the opsonic index, particularly in distinguishing tubercular from staphylococcic infection. He laid stress on studying the positive or negative phase 24 hours after an injection. He believed the first suggestion of diagnosis by giving small doses of dead bacilli was made by Drs. Lawson of Banbury and Ian Stewart of Edinburgh in the Edinburgh Medico-Chirurgical Transactions, 1905. Mr. Jessop discussed the case, and Dr. Mackay replied.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

At the meeting of the society held at the hospital on Monday, May 4, 1908, at 3:30 p. m., Samuel D. Risley, M. D., in the chair, several clinical cases were exhibited and a formal program was presented for discussion.

Dr. S. Lewis Ziegler exhibited a negro man with symmetrical enlargement of his lachrymal, parotid and submaxillary glands and the tonsils. The disease had existed for 18 months. The only treatment thus far had been tonsillectomy.

Dr. Risley showed a negro boy who had been under observation at his clinic only a few days with what appeared to be a malignant phlyctenular conjunctivitis, and the question arose as to whether or not it might be a case of tuberculosis of the conjunctiva.

Dr. Clarence Eldredge described the effects the administration of thyroid extract had had upon a negro boy with interstitial keratitis who had been under treatment for a month. In addition to a loss in weight, choreiform movements were manifested in his hands, and in walking.

Dr. William Posey showed a man with gonorrheal uveitis whose joints had become affected. He again exhibited a negro with tubercular iritis who has been under his observation at the hospital for several months past.

Dr. Frank C. Parker in speaking of the "Value of Photography in Ophthalmology" said much valuable data might be secured by photography provided proper conditions for rapidly carrying on the process could be secured. He urged that every hospital should offer such opportunities to thus add to the value of the records of cases. A photograph both before and after operation on cases of squint; cases requiring extensive plastic procedures, of neoplastic formations, or others of disturbed lachrymal functions. Most of the published cuts show that the photographs have been made under adverse conditions; frequently they have been made in the clinic room or ward. A properly lighted room should be equipped with all necessary facilities for exposure.

A large number of photographs were displayed. They had been taken by an ordinary hand camera supplemented by a four diopter convex lens to make a larger image. Many of Dr. Parker's mounts were in high relief, which he obtained by an ingenious method for which he makes no claim for originality, although he said he had not found anyone who could tell him how relief photographs were made. He places the print upon a window pane and

traces on the back the outlines of the portions to be raised. Then face down upon a blotting pad, the parts are indented by pressure with a dull point. The pressure is varied to meet the demands of the case. In the process the print is not to be moistened at all.

Dr. Posey accentuated the remarks of the speaker and said that photography was particularly valuable in the study of squint, especially of congenital squint, where often more than one operative procedure is necessary before the final correction of the deformity can be attained. He referred to the value of photographs as a means of demonstrating the effects of plastic operations on the lids, and he finally exhibited a large number of striking photographs, taken for him by his assistant, Dr. W. C. Swindells, of cases which had been under his care.

Dr. Zentmayer praised Dr. Parker's excellent exhibition and expressed the hope that the invention of satisfactory color photography would soon be accomplished.

Dr. Ziegler said that good color effects could be obtained by the four-ply process; and he is glad to state that all color processes are less costly than formerly.

Dr. Risley also congratulated Dr. Parker, and he thought photography would greatly aid us in the illustration of our publications.

Dr. George Robinson described a "Case illustrating the results of iridotomy." The patient had been operated on for senile cataract. After four days' serious iridocyclitis developed and after six weeks' the pupil was closed and the vision was reduced to l. p. Then an iridotomy was performed by the method of Ziegler, and today the patient has a corrected vision of 20/40.

This method so strongly advocated by Dr. Ziegler is performed with a Hay's knife only. This knife has a shank which entirely closes the puncture made in the cornea and thus prevents the escape of the aqueous. The cornea is punctured and the point of the knife is carried down across the sheet of the iris to beyond the position of the usual pupil border, then a dart-like thrust is made into the membrane and by rapid sawing motions the blade makes an incision obliquely up to the vertical meridian beneath the point of entrance in the cornea. Then the point of the knife is carried down to a position equally distant from the vertical opposite the base of the first incision and another cut is made and brought up to intersect the end of the first incision. The membranous tongue then retracts and the result is a triangular opening.

Dr. Ziegler in discussing his favorite procedure detailed the

history of pupillary iridotomy and described the instruments devised for that purpose. The Hays' knife is unique and was invented by Dr. Hays while he was surgeon to the hospital as far back as the early '50s.

Dr. William Posey spoke of "Tenotomy of the Inferior Oblique Muscle" as an operative procedure which had recommended itself to him in some dozen cases in which there had been an over action of this muscle. The chief indication for the performance of the operation is the upward and inward tilting of the eye, which can be seen when the eyes are directed to the extreme right or left, when there is a paresis of the right or of the left superior rectus muscle. The technique of the operation he said is simple; the tendon of the muscle being divided close to its origin at the lower inner angle of the orbit, by an incision which is made through the lid, somewhat lower, and more external, than that which is made for the removal of the lachrymal sac. The insertion of a strabismus hook through the wound, and the upward movement of the eye following traction upon the tissues, indicates that the tendon of the muscle has been caught. The division of the tissues on the hook follows. Healing has been prompt in all cases operated upon by Dr. Posey, and there have never been any complications. He spoke of Duane's paper upon the subject, and in closing pleaded for a more general performance of tenotomy.

Dr. S. Lewis Ziegler exhibited a number of patients to show "Some Results of Galvano-Cautery Puncture." He employs a galvanized point to produce a subcutaneous eschar to effect contraction of tissues which have been distended by inflammation. He finds it of great service in entropion and ectropion; in destroying granulations in trachoma, and in taking the place of peritomy in cases of pannus in that disease. Only when the tissues are infected from diseased nasal diet had he noticed marked reaction following the punctures.

Dr. Harlan said he has used potash and other chemical cauterants in cicatricial and spastic disturbances of the lids, but this use of the galvanocautery is a great improvement over other measures.

Dr. Risley said, from his observation of Dr. Ziegler's use of the cautery, he feels it to be a rational and simple procedure, and he has determined to employ it on the next suitable case he has.

Dr. Radcliff told of a case of entropion which had resisted all interference, but after four punctures with the cautery there is now complete relief. Dr. Harlan asked how many punctures were nec-

essary. Dr. Ziegler, in reply, stated that it depended upon the length of the surface to be affected; in some cases he had made as many as eight. He punctures the cartilage and the cautery may be used from the external as well as from the internal surface.

The next meeting of the society will be held on Tuesday, October 5, 1908.

BURTON CHANCE,

235 SOUTH THIRTEENTH STREET,

Secretary.

SECTION ON OPHTHALMOLOGY.

American Medical Association—Abstract Report.

Chicago, Ill., June 2-5, 1908.

A Further Contribution to the Possible Relationship of Auto-intoxication to Certain Diseases of the Cornea and Uveal Tract (Special Investigation).

Dr. G. E. de Schweinitz and Chas. A. Fife, Philadelphia, conclude that as yet no definite ptomain or toxin has been isolated which would justify a diagnosis of auto-intoxication in any single case. A resume of products detected by urinary analysis, examination of feces and examination of gastric contents which permit belief that auto-intoxication and its effects may be worthy of consideration was given. Cases were reported: 1. Relapsing sclerokeratitis of four months' duration. 2. Bilateral parenchymatous keratitis. 3. Disseminated exudative choroiditis. 4. Relapsing uveitis of ten years' standing. 5. Relapsing iritis (uveitis). 6. Central exudative choroiditis and peripheral retinochoroiditis. The authors called attention to the relationship which exists between outbreaks of uveal tract disease and lesions of the skin, especially acne, eczema and herpes zoster, and showed that in one and the same patient it is probable that the interpretation of an intestinal toxemia may sometimes be manifested in an effort of elimination by development of skin disease and sometimes by the appearance of a choroiditis or uveitis.

Dr. Casey A. Wood, Chicago, called attention to the number of papers read at the Congress of Internal Medicine in Vienna upon bio-chemical and allied subjects and thought that if the metabolic processes in the body have attracted so much attention in internal medicine the ocular apparatus could hardly be expected to altogether escape. He thought there was a distinct basis of belief for the theory of auto-intoxication as a result of vicious or irregular metabolism.

Dr. Edward Jackson, Denver, emphasized the practical importance of the subject presented by Dr. de Schweinitz. Individual cases should be carefully studied although the services of skilled internists, like Dr. Fife, might not always be obtainable. He reported two cases, one of uveitis and one of iritis greatly improved by attention to hygienic measures, diet and exercise.

Dr. Lucien Howe, Buffalo, advocated the making of such tests by everyone and explained a simple method of examining the stomach contents.

Dr. Melville Black, Denver, congratulated the essayists on the completeness with which the cases had been studied and said it was only by such vigorous research that we should be enabled to depart from empiricism. It was only by careful laboratory analysis that the subject could be cleared up.

Dr. Arnold Knapp, New York, had had a number of cases examined, but regretted to say that the results had not been at all definite, but he believed that this was the line along which work must be done in order to clear up some of these obscure uveal diseases.

Dr. Tidings, Chicago, reported a case of uveitis that cleared up after correction of an obstinate constipation, a rectal operation being required.

Dr. Hiram Woods, Baltimore, thought the tendency of modern investigation was leading back to principles of treatment that were empirically established in books published a half or three-quarters of a century ago, in which stress was laid upon the importance of paying attention to the *prima via*. He considered it a large field and promised if properly studied to raise a great many mysterious things from the idiopathic waste basket.

Dr. Leartus Connor, Detroit, thought the authors had carried the matter farther and with more exactness than others, but believed that empirically all worked along the same lines as far as possible.

Dr. Walter L. Pyle, Philadelphia, thought the majority would be disappointed in the results. He had had numerous examinations made without definite results. It required great special skill to properly make the examinations and often with the correction of refractive conditions there would be signs of returning health before a report could be obtained from the chemist.

Dr. G. E. de Schweinitz, Philadelphia, in closing, said he agreed with Dr. Knapp in his statement that the examinations could not be made in a perfunctory manner and he was correct in

saying that the results were frequently disappointing: the investigations must be in the hands of an expert. It was only desired to show that this was a line of investigation worth carrying on.

The Eye as a Contributing Factor in Tuberculosis.

Dr. F. Parke Lewis, Buffalo, said the universality of tuberculosis leads to the belief that especial vulnerability is a necessary prerequisite to infection, and the paper was based on the following propositions: 1. Errors of refraction may so di-arrange nervous functions that gastric or intestinal disturbances may result and metabolism be retarded in consequence. 2. Continued existence of such conditions may so lower the vitality as to retard recovery from tuberculous infection of the lungs. 3. Relief of abnormal visual conditions is a necessary prerequisite to recovery from pulmonary disease. 4. Complete examination of suspected tuberculosis patient has not been made until the condition of the eyes has been investigated and recorded. The essayist reported illustrative cases of eye strain in the production of digestive disturbances. He believed that careful visual tests should form an essential part of the examination of every suspected case.

The Ocular Reaction to Tuberculin.

Dr. H. C. Parker, Indianapolis, spoke of the technique of the reaction and its results by various observers and considered the comparative diagnostic value of subcutaneous injection, vaccination, and ocular reaction to tuberculin. He concludes that the ocular tuberculin test is of as great diagnostic importance as any other single test; that positive reaction is indicative of tuberculous focus somewhere in the body; that the test is uncertain in patient under two years of age; that it fails in advanced cases; initial instillation should be preferably under 1 per cent; second test should be made in eye not previously used; consensus of opinion was against using the test in eye not wholly normal. The number of ophthalmic affections due to tuberculosis he believes to be greater than formerly. He considered the ocular reaction especially valuable for ascertaining the tuberculous nature of many eye affections and that solutions of Koch's "old" tuberculin is nearly as good as the Calmette reaction for diagnosis. He felt that the value of the test was assured.

Dr. Llewellyn Williamson, St. Louis, said the interest which the whole civilized world, both medical and lay, was now taking in the prevention and treatment of tuberculosis, made Dr. Lewis' paper a particularly timely one. He had seen cases of gastric neuroses

dependent upon some error of the visual apparatus and called attention to the articles of Stevenson and Stockton on the relation of the eye to the digestive system, but he thought no one had called attention to the very important role these gastric neuroses of ocular origin might play in the etiology and treatment of tuberculosis. The failure of the internist to recognize the effects of the ocular neuroses made them none the less important. A long time had elapsed before the constant efforts of many ophthalmologists had induced the general practitioner to believe that many headaches, theretofore variously treated without results, were due to the errors in the visual system, though that fact is now recognized by all physicians. Further effort would have to be put forth before the general practitioner would recognize that ocular neuroses are not confined to headaches alone. The importance of a thorough examination of the eyes in all cases of tuberculosis required no argument.

Dr. E. R. Lewis, Dubuque, Iowa, said that though he failed to agree with all the conclusions of the essayist he was none the less sensible of the careful study and the conscientious attempt at a proper estimation of these new diagnostic measures. He had had no untoward results following instillation of $\frac{1}{2}$ of 1 per cent solutions of the alcoholic precipitate. Most of the cases presented positive clinical evidence of tuberculosis, yet in less than 50 per cent was the reaction to the conjunctival test positive. There was great need of more uniformity in the technique of the application of the test. He believed that later these tests would fill a place among methods of precise diagnosis.

Dr. John Green, St. Louis, had become impressed with two facts as to the use of the Calmette test—the possibility of excessive reaction, and the occurrence of reaction when other tuberculosis tests were negative.

Mr. E. Treacher Collins, London, England, thought there were few subjects in ophthalmology of more interest than that of our increasing knowledge regarding tuberculosis of the eye and thought it strange that physicians had been so slow to recognize tuberculosis of ocular origin. Every new test brought out had forced the recognition that eye disease is more frequently tuberculous than had been formerly thought. He thought the Calmette test not altogether devoid of unpleasant symptoms; he had had one case in which the reaction had lasted quite three weeks after application, a muco-purulent conjunctivitis persisting, and, two of his colleagues had had cases of choroiditis follow the application. He

called attention to a form of episcleral choroiditis, often diagnosed as of rheumatic origin, which he believed in the majority of cases was tuberculous.

Dr. A. E. Davis, New York, could not agree with Dr. Lewis' conclusion in article 3, that the relief of abnormal visual conditions is a necessary prerequisite to recovery from pulmonary disease, though he recognized the fact that anything that lowered the vitality in these cases had a detrimental effect upon recovery, but he thought it must be in exceptional cases that glasses could give such relief.

Dr. G. F. Keiper, LaFayette, Ind., thought it too early to draw any conclusions as to the value of the Calmette test. An eye involved in any disease should never have the tuberculin reaction introduced because of the danger of excessive reaction likely to follow. It was better to make the subcutaneous or von Pirquet test.

Dr. Edward Jackson, Denver, referred to a case in which the patient lost an eye ten years ago from chronic uveitis and now came with the third attack of uveitis in the second eye: using the Calmette test in the blind eye he got a typical reaction that lasted sixteen days. There had appeared just in the limbus three or four spots of hyperemia which under magnification proved to be areas of increased vascularity right under the edge of the sclera.

Dr. Robt. Randolph, Baltimore, said they had been much impressed with the great sensitiveness of the test in the Phipps Laboratory of the Johns Hopkins Hospital, but like the other tests, von Pirquet's for instance, it was apt to mislead by revealing a condition which is clinically of no importance. A positive reaction not infrequently means an old focus, or foci, which have healed and which exist in a patient practically sound.

Dr. Nelson M. Black, Milwaukee, referring to the untoward results following the use of the Calmette reaction said that in none of the cases reported of severe conjunctivitis following the use of the ophthalmic reaction had the condition of the conjunctiva previous to the application of the test been stated. He thought a bacteriological examination of the contents of the conjunctival sac before applying the test would be wise.

Dr. A. R. Baker, Cleveland, had not felt called upon to use the ocular tuberculin test, but had seen some bad reactions from it as used by other men in the dispensary.

Dr. Hiram Woods, Baltimore, had followed a series of 37 cases in which the test had been used. In one child a $1\frac{1}{2}$ per cent solution used in one eye failed: four weeks later a 1 per cent solution used in the other eye was followed by a muco-purulent con-

conjunctivitis and the development of a very obstinate corneal ulcer. That was the only bad result.

Dr. F. Parke Lewis, Buffalo, in closing the discussion said he did not want to be considered as believing that all cases of tuberculosis had an ocular basis, but he thought the eye should be carefully investigated in cases of suspected tuberculosis.

Dr. H. C. Parker, Indianapolis, in closing, said that he had made ten tests within the past two months and in only one of these had he obtained a positive reaction. This was obtained in a patient in whom there was not the slightest evidence of tuberculosis. There was in this case a purulent discharge with lid oedema and chemosis.

Ocular Complications of Pregnancy (Special Investigation).

Dr. Hiram Woods, Baltimore, said that apart from various nervous symptoms incidental to pregnancy, which often affect the eye, there were four serious ocular manifestations seen more or less frequently during pregnancy or after parturition. These were: 1. The so-called uremic blindness, which is usually seen in eclampsia. 2. Albuminuric retinitis, or what has always been termed that. 3. Loss of central or peripheral vision due, as far as symptoms point, to a retrobulbar neuritis. 4. A form of neuroretinitis, not essentially suggestive of the albuminuric type, but showing numerous retinal exudates and hemorrhages. The clinical symptoms of these conditions are reviewed and the classes studied from the standpoint of recent pathological investigations in the obstetrical field. There is, in view of these investigations, doubt as to whether the term uremic should be applied to blindness occurring in connection with puerperal eclampsia, the same being true regarding the renal origin of what is termed the albuminuric retinitis of pregnancy. He thought there was good reason to believe that both the renal and ocular complications are manifestations of the same process—a toxemia.

Dr. Charles Stedman Bull, New York, said that modern pathology has taught that a number of ocular conditions hitherto attributed to the pregnant state are not due directly to pregnancy as a cause. The pregnant state increased the liability to disease by lessening the patient's powers of resistance. The blurring of vision, occurring from time to time in pregnant women, and formerly attributed to paralysis of accommodation, might rather be ascribed to the general nervous strain in which the pregnant woman lives, affecting her circulation. Uremic amaurosis he thought was usu-

ally confined to eclamptic cases and followed the convulsive attack. He believed it to be an open question as to whether this was really uremic or not. In albuminuric retinitis of pregnancy the prognosis as to vision and life depended upon the duration of gestation. It was probably that by induction of premature labor a better prognosis as to ultimate vision might be given. As to retinitis gravidarum—if labor was not induced the majority, if they lived, would be permanently blind. Modern pathologists no longer regarded the kidneys as the only pathway from the uterus to the eye. He considered it incorrect and unscientific to speak of the albuminuric retinitis of pregnancy, that it does not exist unless the kidneys have previously showed the existence of interstitial nephritis.

Dr. W. C. Posey, Philadelphia, said that in a paper he had recently read in conjunction with Dr. Hirst, of Philadelphia, entitled "The Importance of An Ocular Examination in Pregnant Women Manifesting Constitutional Signs of Toxemia," a description was given of certain ocular lesions which may arise in pregnancy as a consequence of a toxemia other than albuminurea. He thought Dr. Woods had done well to emphasize that a toxemia other than that of albuminuria may provoke ocular changes during pregnancy. The importance of an ocular examination in all doubtful cases could not be overestimated, as the detection of changes in the eye grounds, even without the presence of albumin in the urine should lead to the adoption of a line of treatment, which might be the means of saving the life of patient.

Dr. Casey A. Wood, Chicago, called attention to a rare form of the sequellae of pregnancy—that of metastatic panophthalmitis, described by Hirschberg many years ago, and reported such a case, which was of particular interest in that the patient survived, an unusual outcome, because when the septicemia is so marked as to involve the eye, the case is usually fatal, and secondly in that it was bilateral.

Dr. E. C. Ellett, Memphis, reported two cases bearing on the points made by the essayist, in both of which the evidence of the relationship of the toxemia was very plain.

Dr. Arnold Knapp, New York, referred to a corresponding case which he had reported last year before the American Ophthalmological Society in which further manifestations of a toxemia had been shown by a careful analysis of the urine.

Dr. Harry Friedenwald, Baltimore, had observed several cases of eclampsia that recovered and were blind for some time after delivery. It had been generally assumed that the visual impair-

ment in this condition is due to the toxic effect upon the cerebrum, but in one of these patients the vision gradually returned, but there was at first a marked central scotoma; the periphery of the field of vision in both eyes recovered first and it was assumed that the toxic effect had been upon the optic nerve rather than upon the cerebrum.

Dr. Marcus Feingold, New Orleans, thought the question would frequently arise of what to do in a case of retinitis in a patient not previously examined—could it be called a case of retinitis due to toxemia or retinitis due to a previous nephritis?

Dr. Robt. Randolph, Baltimore, though all were agreed as to the proper treatment of this class of cases and that the proper course to pursue is to induce premature labor where it is evident that the integrity of the retina is in danger. Ten years ago he had reported five cases of albuminuric retinitis in pregnancy, all with marked ophthalmoscopic pictures, and all had albumin in the urine. He thought there was no retinal change so infallibly suggestive as the picture called albuminuric retinitis, with its flaky superficially situated spots, not necessarily arranged in the classical way in the macular region, but distributed indifferently about the retina and impressing one by their evidently superficial location. Though the toxemia of pregnancy might be responsible for the eclampsia, it should be remembered that the question of the pathogenesis of eclampsia had always been and still is a very debatable one, and while recent investigations had rather lessened the importance of renal disease as a cause of eclampsia, for all that in by far the majority of cases there is demonstrable proof of renal disease and this being the case, one would have no more right to deny the agency of the kidney in causing the retinitis than to deny the origin of the retinitis in an individual who was not pregnant, but who presented the usual signs and symptoms of a chronic interstitial nephritis. Repeated examinations of the urine should be made before deciding whether dealing with a renal retinitis or not. As to the characteristic features of albuminuric retinitis having been observed in sixteen cases of brain tumor where no albumin was found in the urine, care should be exercised in drawing conclusions until possible renal involvement had been completely excluded. He had recently examined two cases of brain tumor in the Johns Hopkins Hospital and in both these there were choked discs and the so-called albuminuric retinitis, but there were casts and albumin, too, in the urine of both these cases.

Dr. Hiram Woods, Baltimore, in closing, said that in making

a diagnosis as to whether the condition was toxic or renal, the only line along which it could be done was that of complete analysis after the manner laid down in Dr. de Schweinitz's paper. Even if there were such a condition of the kidneys, a continuation of the toxemia would make the kidney condition worse. As to Dr. Randolph's remarks, the essayist thought that undoubtedly there is strong corroborative evidence as to the kidney being the cause, but at the same time it does not negative the fact that the same toxin that can produce the blindness can also affect the kidney. The promptness with which the kidney gets well after delivery was against the idea of such a nephritis as could produce the serious lesions observed in the eye.

The Relation of Ocular and Cardiovascular Disease.

Dr. Melville Black, Denver, brings out the importance of estimating blood tension in conjunction with a careful examination of the heart by "deep percussion," as well as a quantitative and qualitative examination of the urine in all cases seen by the oculist presenting intraocular evidences of vascular changes. The oculist should be constantly on the lookout for these danger signals in the eye, retinal hemorrhage frequently caused by general venous stasis, dilated heart and lowered blood pressure.

Dr. L. H. Taylor, Wilkesbarre, thought the paper emphasized anew the fact that the ophthalmologist must be something more than merely a student of eye disease; he must be in its broadest sense a physician as well as an oculist. He reported several cases bearing upon the points made in the paper and believed we were coming more and more to recognize that often our treatment must be directed not to the eye, but to the general system.

Dr. G. E. de Schweinitz, Philadelphia, thought that the writer's insistence that early recognition of angio-sclerotic changes may enable us to give many years of life to a considerable number of patients who come for consultation deserved to be emphasized. The ophthalmoscopic signs, in their earliest or latest stages, were good evidence of local angio-sclerosis and frequently of persistent high arterial tension and was one of the most ready clinical means for the early detection of important arterial changes.

Dr. Chas. H. Williams, Boston, referred to a case in which such diagnosis had been made by the ophthalmic signs, there being hemorrhages in the retina, with changes in the retinal vessels, some being obliterated and some drawn into small white lines.

Dr. Edward Jackson, Denver, referred to a case of dilatation

of the heart with such ophthalmic changes in which there was low blood pressure, but which was probably only temporarily low. After a short period of restricted diet and proper medicinal treatment he improved markedly and at the end of three months his vision was decidedly improved. He had seen several cases in which normal vision was restored by paying attention to the temporary failure of circulation.

Dr. A. R. Baker, Cleveland, advocated the use of the blood pressure instrument by ophthalmologists themselves rather than referring the patients to a general physician for such examinations.

Dr. G. F. Keiper, La Fayette, said there was a great deal of angio-sclerosis in the young as well as old and he believed that the instrument for measuring blood pressure was just as essential to the ophthalmologist as the ophthalmoscope. He insisted upon the use of the broad cuff as recommended by Janeway.

Dr. Melville Black, Denver, in closing the discussion, emphasized the importance of recognizing what the condition of blood pressure is by actual tests; it was impossible to determine it by the appearance of the retinal circulation.

Voluntary Unilateral Nystagmus, with Report of a Case.

Dr. Walter L. Pyle, Philadelphia, reported a case of voluntary and unilateral nystagmus in a healthy young woman of 22. Rapid oscillations of left eye could be voluntarily produced, while right eye was maintained steadily fixed during the act of moderate convergence. Motions could be continued for no longer than thirty seconds. The nystagmus was quite under the control of the will and could be inaugurated at suggestion and as promptly checked. Oscillations could not be produced in right eye. Careful examination of both eyes showed no significant pathologic lesion. There was slight compound hyperopic astigmatism at horizontal axes, equal in amount in both eyes. Corrected visual acuity was normal. No heterophoria or other anomaly of ocular musculature. The writer reviewed the literature relating to cases of voluntary nystagmus and to cases of unilateral nystagmus, with particular reference to etiologic suggestions. No mention of voluntary unilateral nystagmus could be found.

Dr. M. Wiener, St. Louis, emphasized, with Dr. Pyle, the necessity for correcting the error of refraction in these cases of nystagmus and referred to a case of unilateral nystagmus he had had a year ago in a patient of 39, in which the left eye on being fixed was perfectly quiet, while in the right there was marked lateral

nystagmus. On giving a full correction the nystagmus almost entirely disappeared.

Dr. A. E. Davis, New York, mentioned a case of a young girl of 8 in which both eyes were involved and there was no refractive error of any amount. The fundus of the eye was normal and she had complained of no headaches.

Dr. Walter L. Pyle, Philadelphia, in closing the discussion, called attention to the fact that in spite of all efforts to concentrate and fix the eyes there is still an unconscious, but yet appreciable movement at all times. The assumption of the older psychologists that there was a definite visual "point of regard" is now challenged upon very convincing experimental evidence. Prof. Raymond Dodge claims that instead of a "point" the center of visual interest is a very appreciable "area."

Zonular Opacity of the Cornea.

Dr. F. C. Heath, Indianapolis, said the condition was described very briefly in the majority of text-books and in some not mentioned at all. The work of Dixon, Bowman, Nettleship, Graefe and others was reviewed. The disease was first described by Dixon in 1848. Synonyms were calcareous opacity, ribbon-shaped keratitis and band opacity of cornea. Two forms, primary in eyes otherwise good, secondary in eyes already blind. Both rare, but primary much rarer than secondary. Described as punctiform opacities, a gray stripe stretching across the cornea, surrounded by a narrow rim of clear tissue. Very slow development, found chiefly in men and after middle age. Pathology: hyaline degeneration of corneal cells that later become calcareous. Etiology very obscure. Some cases improved by scraping, others by iridectomy, although Noyes and Fox thought treatment of no avail. Detailed report of case was given in which affection began in left eye in 1896, in right eye in 1904. Pain in first stage. Slow development of haze across each cornea with marginal rims of clear tissue. Scraping was without avail; good results of iridectomy. There was inexplicable improvement in unoperated eye.

Dr. E. V. L. Brown, Chicago, said that so far as he knew no cases of primary zonular opacity had come to anatomical study so that the etiology was not clear; secondary cases were explained on the basis of hyaline and calcareous degeneration of the anterior part of the cornea and Bowman's membrane.

Dr. L. H. Taylor, Wilkesbarre, had seen one case of this kind.

in which there were two bands, a band in each eye and perfectly symmetrical, one at an axis of 45 and the other 135 degrees.

Dr. Edward Jackson, Denver, had seen three cases of primary opacity of this kind at comparatively long intervals, the first seen very soon after he entered practice, a second one at the Wills' Eye Hospital, and the third within the last two years. The opacity in all three was characteristic.

Diffuse Interstitial Keratitis in Acquired Syphilis.

Dr. A. E. Davis, New York, referred to the rarity of the condition in acquired syphilis and reported two cases, also citing well authenticated cases from the literature. Syphilis as a cause of the disease had been doubted by some oculists and oculists were requested to report cases coming under observation. His conclusions were: 1. That diffuse interstitial keratitis may occur as a result of acquired syphilis. 2. It usually occurs as late secondary sign or during relapses in tertiary stage. 3. It almost invariably affects but one eye. 4. It generally runs quicker and lighter course than cases due to inherited syphilis and is rarely harmful to sight. 5. That true "salmon patches" occur, but very seldom in these cases. 6. It is difficult to make a clinical diagnosis between the syphilitic and tuberculosis forms of the disease, and even differential pathologic diagnosis is not always conclusive. 7. Prognosis is favorable, though it should be somewhat guarded from the fact that sight has been lost in one case thus far reported.

Dr. J. L. Thompson, Indianapolis, had seen at least a dozen cases in thirty-eight years. He was surprised that there had not been more cases reported.

Dr. W. H. Wilder, Chicago, had reported three cases before the section at the meeting in St. Paul, but had found the literature on the subject rather sparse. He had observed that there was not that tendency to vascularization of the cornea seen in cases due to inherited syphilis, but sometimes there was a condition like sclerosing keratitis.

Dr. Leartus Connor, Detroit, in a case seen recently had been able to decide the possible origin of tuberculosis from syphilis by the finding of the spirochaetae by an expert.

Dr. A. R. Baker, Cleveland, only recalled one case in which there had been doubt that the condition was due to congenital syphilis. In that case, some time after treatment, the man married and a year or two later had a child that developed interstitial kerati-

tis, strengthening the assumption that it had been a case of acquired syphilis.

Dr. A. E. Davis, New York, in closing the discussion, said he thought there could be no question as to the origin of some of these cases, as it had been produced in the lower animals by scrapings from the human chancre.

Opacification of the Cornea Following Cataract Extraction.

Dr. Vard H. Hulén, San Francisco, reported the history of a case embodying both the forms of general diffuse opacification of the cornea and striped keratitis, the cause of which was obscure, the opacity permanent, vision 2/200. He thought that pathologic diagnosis not based on a microscopic examination was not reliable. He concluded from the study of the subject that treatment is of but little or no avail, and that there is no indication at present known which enables us to determine beforehand when general opacification of the cornea may follow cataract extraction. But with the warning from such a result in one eye, the cause undetermined, he would favor some method other than extraction for the remaining cataract, and suggested this as one of the very few conditions where couching might be a justifiable operation.

Dr. J. L. Thompson, Indianapolis, had reported three cases and had since seen another occurring during an epidemic of grippé, in which there was no tendency to suppuration, but the cornea became entirely opaque.

Dr. D. W. Greene, Dayton, said that in over 1,000 operations of the lens which he had done in the past twenty-five years, largely in a class of men, veterans of the Civil War, many of them broken in health and subject to dissipation and vices of all kinds, more than 90 per cent of whom were now above 60 years of age, he had not seen a total opacity of the cornea result in a single case. In private practice he had seen one case. He thought the making of too small a corneal incision had done more to keep up the number of cases than anything else, except inordinate pressure in delivery.

Dr. H. V. Wurdemann, Milwaukee, said that in something over 1,000 extractions he had total opacity of the cornea follow but once, but that within the last two years he had seen eight cases of striped keratitis following extraction operations and he believed it due to mechanical pressure of the instrument in expressing the lens. He also believe the condition had been due heretofore to the use of strong antiseptics.

Dr. G. C. Savage, Nashville, had for a good many years made

but little pressure on the cornea in expressing the lens, he used just enough pressure to make the lens present itself in the incision and then transfixed it from behind and lifted it out. He strongly advocated the use of dionin for clearing up these opacities.

Mr. E. Treacher Collins, London, Eng., regarded the condition as due to damage to Descemet's membrane, which ordinarily prevents the infiltration of aqueous humor into the stroma of the cornea, but which when damaged allowed such infiltration to occur with resulting opacification. The cases in which he had seen most opacity follow extraction had been after the use of strong antiseptics.

Dr. Clarke, who had done some pathological work with Mr. Collins in London, had some slides which confirmed the opinion expressed by Mr. Collins in this regard.

Dr. Wm. Zentmayer, Philadelphia, had never seen an instance of this opacification in his own practice, but had seen one in the practice of another physician. In the patient referred to the condition occurred in both eyes following extractions, and the patient subsequently developed phthisis and died three years subsequent to loss of sight. Whether the corneal condition might have been due to impaired nutrition at that time or whether he had a uveitis as a result of his tuberculosis was not determined.

The Surgical Treatment of Orbital Complications in Disease of the Nasal Accessory Sinuses.

Dr. Arnold Knapp, New York, considered the complication of orbital subperiosteal abscess and presented clinical pictures. The writer describes his method of operating by external incision, detachment of trochlea, detaching the insertion of pulley without interfering with the superior oblique muscle, resection of entire floor of frontal sinus, nasal process of superior maxilla, lachrymal bone and os planum of ethmoid. If frontal sinus extends high up, he does partial resection of anterior bony wall. The elements of success he considered were the use of a proper light (either with mirror or electric forehead reflector), the control of hemorrhage and knowledge of the anatomy.

Dr. Bernstein, Kalamazoo, thought the Killian incision would leave less deformity than the one suggested by the writer. He did not think it necessary to displace the trochlea at all. He preferred the incision through the eyebrow.

Dr. W. C. Posey, Philadelphia, thought that while, of course, the extensive incision described by Dr. Knapp is necessary in some

cases of involvement of the frontal and ethmoidal cells, a smaller incision would suffice in many instances and excellent drainage could be established without the loss of so much bone. He thought Dr. Knapp's procedure for the safety of the pulley of the superior oblique ingenious and would follow his direction. He had found the speculum of Axenfeld used in the removal of the lachrymal sac of great service in sinus operations.

Dr. A. E. Davis, New York, cited a case in which an eye was lost by an operator trying to drain the antrum of Highmore through the nose; the orbit was infected and intense orbital cellulitis occurred with loss of the eye.

Dr. Arnold Knapp, New York, in closing the discussion, said he considered it of advantage to have the incision below the eyebrow because in some cases it was desired to keep the wound open and it could be drained better if the incision were not in the line of the eyebrow.

An Infrequent Type of Optic Nerve Atrophy.

Dr. H. F. Hansell, Philadelphia, said our studies of affections of the optic nerves have been directed more toward pathology and diagnosis than therapeutics. He presented a short description of anatomic relations of the intracranial portion of the nerve with the posterior ethmoid and the sphenoid sinuses. Diseases of the accessory sinuses were an important factor in the etiology; its presence, difficulty of determination, in the early stages, and the value of repeated examinations were considered. Two case histories, one sphenoidal in origin, the other syphilitic were given. The characteristic features in the diagnosis of the latter were absence of pupillary phenomena and of symptoms of general disturbance of the nervous system, the peculiar deep seated paleness of the papillae, the concentric limitation of the fields, the temporary scotoma and the unprogressiveness of the affection.

Dr. Post recalled a similar case in which there was loss of vision, and in which the condition was not permanently improved by treatment of the ethmoidal cells, secondary involvement of the optic nerve probably having gone so far before the patient came under rhinological treatment that it was not possible to check it.

Dr. Huizinga, Grand Rapids, had under treatment a case similar to the one described by the writer, in which vision improved immediately after nasal operation.

Dr. H. F. Hansell, Philadelphia, in closing, said that the treatment of the cases of accessory sinus involvement he referred

to the expert rhinologist. The case of syphilis was treated in the usual way by mercurial inunction and increasing doses of iodide of potassium and sweat baths.

Some Clinical Aspects of Lenticular Astigmatism.

Dr. Edgar S. Thomson, New York, said the subject of astigmatism has for its key note the astigmatism of the lens. Corneal astigmatism could be measured by the ophthalmometer of Javal and Schiotz, but there was at present no means of accurately measuring the lens astigmatism, but subtraction of the corneal from the total astigmatism had to be depended upon. He considered partial contraction of the ciliary muscle the most probable cause. In general in the treatment of every case these factors had to be considered: Corneal astigmatism; lens astigmatism (a) static, (b) dynamic; the degree of compensation, and the factor in the error which is producing symptoms, the last point being the end and aim of our efforts as practical ophthalmologists, the relief of the irritative symptoms being the question of interest to the patient. The clinical features of the various forms of astigmatism with general lines of treatment were considered in detail.

Dr. G. C. Savage, Nashville, denied that there was any such thing as partial contraction of the ciliary muscle, if so atropin would suspend it. He considered Bowman's muscle of great importance in regulating the tilting of the lens and believed that it was supplied by the cervical sympathetic.

Dr. Lucien Howe, Buffalo, described a method of measuring the lenticular astigmatism by means of the ordinary ophthalmometer with the prisms removed. He thought the fact that the iris does act irregularly could be shown by the use of minimum doses of atropin.

Dr. Walter L. Pyle, Philadelphia, thought there was no better evidence of the necessity of using cycloplegics in the examination of the refraction of the eye than the facts set forth by the essayist and subsequent speakers. There was no doubt in his mind of the frequency of partial contraction of the ciliary muscle and in cases of long standing it was likely not possible to produce full cycloplegia at the first examination for refraction. By constant use of initial correction gradual unfolding and relaxation of the spasm occurred, and only after several repeated corrections, under cycloplegia, might the full static astigmatism be determined and corrected.

Dr. Derdiger, Chicago, agreed with the last speaker and cited a case in confirmation of that view.

Dr. A. R. Baker, Cleveland, deprecated the attempts to correct errors of refraction without the use of a mydriatic.

Dr. E. C. Ellett, Memphis, reported a case in which the changes in astigmatism were not gradual, but very rapid, and which treatment by massage, diet, lavage, enemata and plenty of water internally aided the correction with glasses to accomplish a cure.

Dr. A. E. Davis, New York, did not believe lenticular astigmatism was due to partial ciliary contraction. He did not use cycloplegics except when necessary.

Dr. A. E. Bulson, Jr., Ft. Wayne, called attention to the misuse of the terms cycloplegics and mydriatics, one being used when the other was meant by the speakers. He said a mydriatic is not always a cycloplegic although a cycloplegic is always a mydriatic.

A Study of One Hundred Refraction Cases in Indians Fresh from the Plains.

Dr. Clarence Porter Jones, Newport News, Va., made a study of cases confined to pupils in Hampton (Va.) Institute. One hundred cases, covering 289 admissions, 34.6 per cent, requiring glasses. He found that the Indian has marked cycloplegic tolerance—scopolamin ineffective in any strength, homatropin 1:25 to 1:12 grain in each eye effective in all but three cases. Atropin, 2 per cent effective in two, 4 per cent in one case. Of the entire number, 17.65 per cent had trachoma on entrance. Sixteen cases in series, all treated surgically with active after treatment until acute symptoms subsided and cornea clear before refractive test.

Dr. J. A. White, Richmond, thought our early ideals as to the eagle eye of the red man had been shattered by Dr. Jones' investigation, and it was wonderful showing in a race that had been entirely free from the evils as well as the blessings of civilization.

Dr. Walter L. Pyle, Philadelphia, said the extraordinary eyesight of the savage had no relation to the refractive condition, but was entirely a matter of association.

Dr. Derdiger, Chicago, had carried out a similar investigation at an Indian reservation in Arkansas, with somewhat similar results.

Dr. Tiffany, Kansas City, had read a paper twenty years ago at the International Medical Congress in Washington on the subject of errors of refraction gathered from statistics of 2,000 school children among which were Indians at the Haskell Institute, Lawrence,

Kansas, and the examination showed a very large percentage of hypermetropes among these Indians; many of them had disease of the conjunctiva and many were suffering from trachoma.

WEDNESDAY AFTERNOON SESSION.

Developmental Deformities of the Crystalline Lens (By Special Invitation).

Mr. E. Treacher Collins, London, England, showed in his address, which was illustrated with lantern slides, how several forms of congenital cataract are the outcome of arrests of development in the lens and said that the recognition of the stage at which the arrest of development had taken place, though the actual cause of the arrest be unknown, helps to a clearer insight as to the meaning of the appearances presented by congenital cataracts, and offers valuable hints as to the most suitable operative measures to employ in treatment. He concluded from the outcome of his clinical and anatomical studies that the following suggestions might be made concerning the treatment of congenital cataract: 1. To wait until a child is ten months old before operating. 2. In some cases in which the pupil is small and does not dilate well with atropin it is best to commence with an iridectomy. 3. In nearly all cases it is well to begin with a needling for valuable information can be obtained by its means as to the thickness of the capsule and consistency of the lens. 4. If the cataract is dense, white, anterior polar one, set in a ring of clear, or partially clear, lens substance, and apparently flattened from before backward, an attempt should be made to separate the central white opacity with a needle and let it fall into the anterior chamber. 5. If on pricking the capsule milky white fluid escapes into the anterior chamber (congenital Morgagnian cataract) it is well to exacuate the fluid for fear of increased tension ensuing. 6. In some cases of congenital cataract the whole lens and capsule can be removed in a most satisfactory way by grasping it with forceps. 7. If after a needling and some absorption of liberated lens matter a dense, tough, white, fibrous looking membrane remains, there is probably some atypical development of the anterior part of the vitreous, and an attempt had then best be made to forcibly displace the membrane downward and backward out of the axis of vision.

The Association of Lens Opacity with Normal and Pathologic Blood Pressure.

Dr. G. W. Greene, Dayton, Ohio, presented this paper, the purpose of which was to show proportion and kinds of cataract in

200 men above a given age, with normal blood pressure, i. e., under 160 mm. Hg., and 200 men with pathologic blood pressure, i. e., above 160 mm. Hg. That cataract is more common with advancing years, the writer said, is corroborated by these statistics. Association of arterial disease with cataract, 46.5 per cent: in those with normal, and 55 per cent in those with pathologic pressure. Cataract statistics based on blood pressure alone should not be accepted too literally as a measure of amount of vascular disease present. Location of sclerotic process in vessels of great splanchnic area has more influence in determining that tension will be high than diffused distribution of process in superficial vessels. All examinations were made with dilated pupil. The Janeway sphygmomanometer with a 12 cm. armlet was employed. Every patient had been able to walk to clinic room and no case of increased tension had been observed after the instillations of homatropin.

Dr. W. B. Marple said that whether or not we agree with the conclusions of the essayist we could not but admire the careful and painstaking way in which he had done the work and it should be an incentive to all to do similar work in various directions. He considered it not unlikely that Dr. Greene was on the right track, but it would need larger statistics to show to what extent high blood pressure is a factor in the causation of cataract.

Dr. Edward Jackson, Denver, said the result of an investigation is none the less valuable because negative, and while he agreed with the speakers that the question could hardly be settled from the present reported investigation, he thought that so far as it pointed to anything it pointed distinctly to an absence of any connection between increased blood pressure and cataract.

Dr. R. D. Gibson, Youngstown, had visited the Soldier's Home in Dayton and witnessed some of the investigations of Dr. Greene's and had been greatly impressed with the army of old men he had to deal with, something like 7,000, and he thought the opportunities were being made the very best use of by the work of so careful an observer.

Dr. Leartus Connor, Detroit, thought it had not been proved as yet what effect blood pressure has upon disturbances of metabolism, and before any definite conclusion could be reached, that would have to be determined.

Dr. G. L. Keiper, La Fayette, thought if blood pressure were responsible for incipient cataract, we ought to see more cataracts in younger subjects than we do, because angio-sclerosis is not confined to old people by any means.

Dr. Wilkinson, Washington, thought that whether these statistics of Dr. Greene's determined whether blood pressure acts biologically in these cases was yet to be proven, but it certainly opened up the whole field of the etiology and prevention of cataract, and he thought that no branch of ophthalmology had been so much neglected and no class of cases so ignored by the oculist.

Dr. J. L. Thompson, Indianapolis, called attention to an opacity occurring at the lower inner corner of the crystalline lens.

The Treatment of Some Forms of Lens Displacement Other Than Those of Traumatic Origin.

L. D. Brose, M. D., Evansville, Ind., divided these into four groups with illustrated cases: 1. Ectopia lentis, in which treatment is sought to improve vision or because of fear that at some future time displacement may set up intraocular disease. Treatment, lenses; iridectomy, determinable by age, displacement, size of lens and amount of obtainable vision after mydriasis. Possibility of subsequent downward displacement was considered. Discission if possible, and patient under 25. Extraction, if other measures contraindicated and patient 35 years or older. Group 2. Displaced and cataractous lens with chronic intraocular disease. Preliminary iridectomy and extraction for persons beyond 25. If result unsatisfactory and lens absorbable, needle second eye. Patient under 25 and no tendency to intraocular inflammation, preferred discission. Group 3. Ectopia lentis complicated by acute glaucoma. Iridectomy when it can be done without wounding capsule of lens; otherwise, iridectomy and extraction. Group 4. Displaced and cataractous lens, result of acute glaucoma. Extract, after preliminary iridectomy or sclerotomy.

Dr. J. L. Thompson, Indianapolis, said that invariably these patients are myopic and spoke of a case where the lens passed into the anterior chamber and caused glaucoma, and he had been able to replace it again.

History of Iridotomy. Knife Needle vs. Scissors. Description of Author's V-Shaped Method.

Dr. S. L. Ziegler, Philadelphia, said the history of iridotomy reveals constant oscillation from incision of iris membrane by knife needle to incision or excision by scissors through open corneal wound. Cheselden originated the method of incision by knife needle, which Adams revised and improved. Von Graefe believed the knife needle method superior to all others. Janin first devised the method of using scissors through the corneal wound, while

Maunoir made a triangular flap, which procedure DeWecker elaborated and perfected. Iridotomy was now confined to cases of aphakia with membranous occlusion of pupil. The advantage of the knife needle in such cases was considered. Good artificial illumination was necessary. The author described his method of making the incision and of withdrawing the knife. The resulting pupil should be either triangular or oval, depending on the resiliency of the tissues. The procedure has been in constant use for the past twenty years and has proved equally efficient in simple cases of secondary capsulary cataract and mixed cases of irridio-capsulotomy.

Dr. G. E. de Schweinitz, Philadelphia, pointed out that Dr. Ziegler, although he only now published a detailed account of his operation, had in 1896 made a description of it in one of the editions of Dr. de Schweinitz's text-book. His experience with the operation had been limited, but entirely satisfactory.

Dr. Johnson said that a colleague, Dr. Hammond, and himself had some years ago devised a knife and had done an operation of a very similar character.

Dr. C. H. Williams, Boston, thought there would sometimes be disappointment in the amount of gap obtained after such a cut through the iris and thick membrane which often gets behind the iris, and referred to one case in which there had been trouble of this kind.

Dr. Edward Jackson, Denver, followed in the main these methods and thought that no one who had not tried it in the difficult cases such as Dr. Williams mentioned could realize the wide applicability of the method.

Dr. John Greene, Jr., St. Louis, thought that when possible one should avoid additional operative traumatism of the iris tissue which has shown itself so prone to react to injury.

Dr. A. E. Bulson, Jr., Fort Wayne, Ind., called attention to the importance of having a perfectly constructed knife in accordance with the one devised by Dr. Ziegler.

Dr. M. Wiener, St. Louis, had used the method for the last two years and found it better than anything he had used previously.

Myotics vs. Iridectomy in the Treatment of Simple Chronic Glaucoma. An Analytical Study of Sixty-five Cases Treated by Myotics Over a Series of Years (Special Investigation).

Dr. W. C. Posey, Philadelphia, gave a short review of his paper before the section in 1906, in which the value of myotics properly

employed, in chronic glaucoma, was strongly emphasized. Lack of sufficient number of cases, however, treated solely by myotics over a period of years, had prevented proof of the assertion that this form of treatment was equally as valuable as iridectomy. This lack was now overcome by notes of sixty-five cases of chronic glaucoma which were observed in the practice of the author and of some of his colleagues. An analysis of the sixty-five cases was presented with a comparison with series of cases treated by other author with iridectomy. A detailed report of the sixty-five cases is given.

Mr. E. Treacher Collins, London, congratulated the section on having presented to it such an excellent piece of work. He had been particularly interested in the showing that the earlier the myotic treatment is commenced the better the results as to arrest of the glaucoma. This also applied to operative treatment: the earlier the operation the better the result. He cited one case in which he had obtained excellent results from the myotic treatment.

Dr. C. S. Bull, New York, thought we still needed a larger number of cases on which to base conclusions. As an advocate of iridectomy he recognized the wisdom of Dr. Posey in dividing the cases into three classes for operative purposes. He never advised operation except in the earliest stage. He believed that with the observance of the proper rules operation would give the better permanent results.

Dr. C. P. Jones, Newport News, reported a case in which iridectomy had been advised, but the condition found to depend upon reflex causes.

Dr. Semple, St. Louis, added a case in favor of the greater value of iridectomy.

Dr. John Greene, Jr., St. Louis, in support of Dr. Posey's views related three cases, all occurring in private practice, illustrating the advantages of the myotic treatment.

Dr. Ray, Louisville, said the age at which we get the patient has a great deal to do with the method of treatment. He believed in chronic glaucoma in people under 60 we were more likely to get beneficial effects from the myotic treatment than in people over 60.

Dr. W. C. Posey, Philadelphia, in closing, said that one thing to be learned from the figures was that chronic glaucoma is not the desperate disease which it has formerly been regarded as being. Myotics should be relied on only in those cases free from attacks of so-called glaucomatous congestion.

A Better Prognosis in Penetrating Wounds of the Eyeball.

Dr. J. A. Donovan, Butte, Mont., calls attention to the importance of this subject because on immediate resolution depends the patient's future. Stitching orbital wounds he considers seldom necessary. He advises to cut off and cauterize prolapsed iris, Eserine he considers useless. He thought that many eyes were lost by meddlesome surgery that if kept clean and let alone would be useful. Even severe ciliary wounds properly treated recover. Electrocautery seals wound and checks infection. Foreign bodies inside the eye, if not easily removed immediately, were better not disturbed until reaction subsides, if not producing irritation. Metals were better removed at once. Unless the eyeball is literally destroyed, most can be saved, many with useful vision. One could always wait two weeks when in doubt. The writer considers that sympathetic ophthalmia is becoming rare and will probably be eliminated.

Dr. S. L. Ledbetter, Birmingham, was thoroughly in accord with the essayist on the subject of early operative procedure as he considered it entirely impracticable and impossible in many cases to do anything of a radical nature in the first few days, so that it becomes advisable or even necessary to wait.

Dr. J. L. Thompson, Indianapolis, agreed with everything said by the essayist concerning thorough anti-septic measures and waiting a reasonable time before enucleation, but insisted on not waiting too long, especially in cases where the eye is blind or where though a little sight remains the eye is practically lost and to retain the wounded organ would subject the patient to a fearful risk as to the other eye.

Dr. R. L. Randolph, Baltimore, did not think the views of the essayist would make any material difference in the number of eyes enucleated for fear of sympathetic ophthalmia, certainly not in our attitude toward that disease. He could not agree with the essayist that any parallel could be drawn from a consideration of lower animals when speaking of the rarity of sympathetic ophthalmia. He believed it was rare because of the attitude of ophthalmologists toward this disease and because preventative enucleation is promptly resorted to.

Dr. Melville Black, Denver, did not believe that eyes were sacrificed by surgeons of experience without being given the benefit of the doubt.

Dr. Parks, Harrisburg, spoke of the necessity in wounds

involving the ciliary region of removing the eye promptly, and cited a case in illustration of this.

Dr. Mann, Texarcana, reported two cases in which he had succeeded in suturing the sclera in penetrating wounds with escaping vitreous, saving both eyes.

Dr. A. E. Bulson, Jr., Fort Wayne, thought it was sometimes quite difficult to decide what to do in these cases. He could not endorse the view of the essayist that sympathetic irritation is as rare as he claimed. He said if an effort is made to save the eyeball for a period of five or six days or a week it is possible during that time to foretell the fate of the eye in the majority of instances.

THURSDAY MORNING SESSION.

The Treatment of Stricture of the Nasal Duct with Lead Styles.

Dr. H. Moulton, Fort Smith, Ark., said the best material is the fuse wire consisting of lead with a little antimony, as used by electricians. That styles of this material are pliable and comfortable and can be worn almost indefinitely, if removed and cleaned once or twice a month. He considers that tubes are unclean. That the method is applicable in all cases in which a probe can be passed and which do not yield to a reasonable amount of syringing or probing, and in patients who can not visit the surgeon often. The author finds the method almost uniformly successful and a great saving of time and trouble.

Dr. W. E. Gamble, Chicago, had not used the lead styles, but his experience with the canula had been very unsatisfactory. If wider experience should corroborate the essayist that the styles drain the sac better than canulae the paper will have done a service to ophthalmology.

Dr. Holt, Portland, Maine, thought with Dr. Moulton that it was surprising that a remedy so valuable was so little referred to in the literature of ophthalmology and that if the members would try it in a certain class of cases they would realize its value.

Dr. Walter L. Pyle, Philadelphia, said that the style had been first suggested by one of the nestors of ophthalmology, Dr. John Green of St. Louis, and it has been used in the Wills' Eye Hospital for many years.

Dr. W. C. Posey, Philadelphia, said his experience with lead styles had also been very favorable, but if the mucous membrane of the sac is diseased and the seat of virulent bacteria he preferred extirpation of the sac.

Dr. F. C. Todd, Minneapolis, had used similar methods with styles or canulae for the past ten years; he believed, however, that the gold canulae could be used with more relief to the patient because of better drainage.

Dr. S. L. Ziegler said the use of lead styles had been a continuous one at the Wills' Eye Hospital for thirty-five years. He usually preceded its use by dilatation.

Dr. A. E. Bulson, Fort Wayne, had been lead to adopt this form of treatment because most patients object to probing, which is very painful. He emphasized the importance of having the styles perfectly smooth.

Imperforation of the Lachrymonasal Duct in the New-born and Its Clinical Manifestations.

Dr. William Zentmayer, Philadelphia, presented this paper, which was a clinical one. He said the recognition of the condition was of comparatively recent date. There were several causes for the symptoms usually designated as "congenital dacryocystitis," the most common one, imperforation of septum between the lachrymonasal canal and nasal cavity. Complications and sequelae were—purulent conjunctivitis and lachrymal abscess. A great variety of micro-organisms were found. The prognosis was usually good. There was danger of lachrymal abscess, infection of corneal lesions and of the conjunctiva. The condition might be confounded with ophthalmia neonatorum, catarrhal conjunctivitis and pre-lachrymal cysts. Expectant treatment was deprecated because of danger of complications. Probing or syringing was recommended, preferably the former. Probing was not difficult, as no marked resistance is met with and consequently the danger of a false passage is slight.

Dr. Edward Jackson, Denver, thought that generally the fault is a delay in reaching normal development; failure to develop a lumen, converting the rod of epithelium, which generally marks the site of the lachrymal passages into a tube. Most frequently it occurred at the nasal end of the passage. The condition was most likely to be confused with catarrhal conjunctivitis in the newborn.

Dr. S. L. Ziegler, Philadelphia, had seen but two cases in twenty years, one a case of dacryocystitis, which occurred between the first and second month; second, a case of atresia with epiphora.

Dr. C. J. Kipp, Newark, did not think the cases at all rare and he treated them by simple cleansing and pressure and never used a probe.

Dr. Hiram Woods, Baltimore, recalled four cases, one got well without any treatment whatever; the others were treated by probing under anaesthesia; in two, one single probing put a stop to it.

Principles Underlying the Operative Treatment of Strabismus (Special Investigation).

Dr. Edward Jackson, Denver, said the ocular muscles depend for development, strength, and habitual degree of contraction on nerve impulses controlling them. Operations for strabismus must be in accordance with these impulses. Important practical difference exists between cases in which movements are guided by binocular vision, and those in which they are guided by impressions made on one eye. Single muscle takes part in varied ocular movements. Primary rotators tend to equilibrium in central position of visual axis. Secondary rotators draw and keep the eye away from this position. Relative weakening of primary rotators renders unstable the equilibrium secured. Advancement tends to increase, tenotomy to diminish power of muscle operated on and also of its opponent. Lateral displacement of tendon transfers power from where it is less needed to where it will be more useful. In strabismus, equilibrium is the aim of operative treatment. In some cases equilibrium may be sought by crippling unopposed muscle.

Dr. G. C. Savage, Nashville, referred to the lack of knowledge of the physiology of the ocular muscles, though the anatomical faults, such as variations in size and insertions were not so well understood formerly as now. He explained at length his view of the principles underlying orthophoria, heterophoria and heterotropia.

The Relation of So-called Ophthalmic Migraine to Epilepsy.

Dr. A. A. Hubbell, Buffalo, N. Y., presented this paper, the purpose of which is to present evidence in opposition to a prevalent theory that there is a kinship between ophthalmic migraine and epilepsy. The author cites the opinions of other writers and the arguments which they use to support them. Cases are quoted which are supposed to establish a connecting link of symptoms which are common to both migraine and epilepsy and cases which are supposed to demonstrate a transition or a transformation of one to the other. The author contends that the basis of argument and the nature of the facts are insufficient, giving his own reasons for such a belief. He refers to his own experience in the observation of

1,500 cases, which he believes sustains the idea that ophthalmic migraine and epilepsy are two distinct diseases.

Dr. W. R. Parker, Detroit, said the result obtained from efforts to determine the relationship of diseases when clinical symptoms are similar, the etiology and pathology of which are unknown, is certain to be unsatisfactory, and such is the case in regard to migraine and epilepsy. The relationship would probably remain in doubt until the morbid process underlying each is understood.

Dr. Leartus Connor, Detroit, thought that the evidence of a clinical nature presented by the essayist would probably convince many doubting persons that there was no relationship between these two conditions.

Dr. G. C. Savage, Nashville, said that migraine can be cured by treatment of the eye in many cases and that epilepsy had been cured by operating on the muscles and by prescribing glasses. He thought that no examination is complete, undertaken for the correction of nervous phenomena, that might possibly depend on the eye, unless the feature of eye strain is considered.

Restoration of the Conjunctival Cul-de-Sac for the Insertion of an Artificial Eye.

Dr. M. Wiener, St. Louis, described a method which he considered of advantage where the socket is shrunken, but there is still some conjunctiva left. An incision is made through the conjunctiva and a flap, including only the conjunctiva, is carefully dissected down to the lid margin. This dissection, after being started with a knife, is easily and quickly finished with a small curved blunt scissors. The dissection is then continued with the scissors so as to loosen the skin below the lid margin, leaving a raw surface toward the bulbar side. Sutures with needle on either side are then introduced and passing them through the bottom of the newly made sulcus are brought through the skin and tied over a button. This gives a conjunctival covering for the lower lid and leaves the bulbar surface to be covered. This is done by covering a lead plate, previously shaped, with grafts from the thigh and placing carefully in position.

Dr. F. C. Todd, Minneapolis, thought that the writer's suggestion of the utilization of the remaining conjunctiva where it exists as a lining for the lid was a very good one for the normal position of the lid margin could thereby be better maintained than is the case when skin is used.

Dr. Hotz, Chicago, said in the attempt to enlarge or to re-

store the conjunctival sac the main object must be to restore the lower lid, or the lining of the inside of the lower lid, and to do this, where there is a little conjunctiva left, the plan suggested by the writer was certainly very good.

Mr. E. Treacher Collins, London, had had very satisfactory results in these cases from the employment of the operation devised by Maxwell of Dublin.

Program of *Ophthalmic Section of American Academy of Ophthalmology and Oto-Laryngology*, to be held at Cleveland, Ohio, August 27, 1908.

Symposium.

"Ophthalmic Pedagogy."

Preliminary Training for Those Who Study Ophthalmology to

Engage in Ophthalmic Practice.....Dr. A. A. Hubbell

Teaching of Ocular Pathology.....Dr. C. A. Wood

Refraction.....Dr. Edward Jackson

Ophthalmology for Students of General Medicine.....

.....Dr. Leontus Connor

Sympathetic Ophthalmia Following Mules' Operation.....

.....Dr. Harold Gifford, Omaha, Neb.

Is Menier's Disease of Ocular Origin?.....

.....Dr. F. Park Lewis, Buffalo, N. Y.

Diseases of the Lachrymal Apparatus, Etiology and Treatment. With Special Reference to Extirpation of the Sac.

.....Dr. Ches. S. Means, Columbus, O.

Exophthalmic Goiter.....Dr. Albert R. Baker, Cleveland, O.

Increased Tension in Ocular Diseases of Infancy and Childhood.....

.....Dr. J. E. Brown, Columbus, O.

President's Address—The Limitation of Ophthalmic Practice.

.....Dr. D. T. Vail, Cincinnati, O.

Ophthalmic Physicians and Surgeon or "Oculist and Aurist"—

Which?.....Dr. Lucien Howe, Buffalo, N. Y.

Post Operative Sympathetic Ophthalmitis.....

.....Dr. Don M. Campbell, Detroit, Mich.

A New Method of Tendon Shortening: Presentation of Instruments.....

.....Dr. H. H. Briggs, Asheville, N. C.

Pseudo Optic Neuritis.....Dr. T. B. Schneiderman, Philadelphia

Refractive Myopia.....Dr. Francis Valk, New York City

Operative Treatment of Persistent Glaucoma.....

.....Dr. Percy Friedenbergh, New York City

- Upward Dislocations of the Lens of Traumatic Character, . . .
 Dr. W. F. Mittendorf, New York City
- Two Cases of Parinaud's Conjunctivitis with Remarks,
 Dr. C. Barek, St. Louis, Mo.
- Analytical Description of Eye as an End Organ,
 Dr. Joseph E. Willetts, Pittsburg, Pa.
- Hereditary Blindness and Its Prevention,
 Dr. Clarence Loeb, St. Louis, Mo.
- The Mind of the Patient, Dr. Sam C. Norris, Anderson, Ind.
- Metastatic Carcinoma of the Choroid—a critical study with
 case report,
 Drs. Geo. F. Suker and Lorenzo N. Grosvenor, Chicago
- The Calmette Ocular Tuberculin Reaction for the Diagnosis
 of Tuberculosis, Dr. Geo. F. Keiper, Lafayette, Ind.
- An Epidemic of Pneumococcus Infection and Remarks on
 Acute Conjunctivitis, Dr. Adolf Alt, St. Louis, Mo.
- Superficial Keratitis, Dr. T. W. Moore, Huntington, W. Va.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
 72 Madison Street, Chicago)

Dr. Morel has been made Professor of Hygiene at Toulouse, France.

Dr. Morean has been appointed ophthalmologist to the Hospital Saint Etienne, Lyons, France.

Dr. C. O. King has been appointed consulting ophthalmologist to the Oncologic Hospital, Philadelphia.

Dr. R. R. Stevenson of Sioux Falls, S. Dak., is spending the summer in post-graduate work in the European clinics.

Dr. Samuel G. Higgins announces the removal of his office from 105 Grand Ave. to suite 1124, Wells Bldg., Milwaukee, Wis.

The recent medical examination of school children in Springfield, Mass., shows that 23 per cent of the pupils are deficient in eyesight and hearing.

Professors Graef and Frosch have received 6,000 marks (\$1,150) from the Prussian ministry to continue their researches into the cause of trachoma.

Dr. R. A. Reeve, formerly president of the British Medical Association, has been presented with a portrait of himself from the Ontario executive committee of the association.

Dr. Thomas A. Woodruff of Chicago, who was chairman of the entertainment committee of the American Medical Association, at the recent Chicago meeting, is spending the summer in Europe.

Dr. G. A. Whitledge of Anderson, Ind., has recently returned to that city after an eight months' post-graduate course in Vienna, and has engaged in the special practice of diseases of the eye, ear, nose and throat.

At the meeting of the Colorado Ophthalmological Society held in Denver, April 18th, the following officers were re-elected: Dr. G. F. Libby, secretary; Dr. Melville Black, treasurer; Dr. D. B. Strickley, chairman of the executive committee.

Mrs. Ogilvie, who founded the Readership of Ophthalmology at the University of Oxford, England, with a gift of \$25,000, died in Sizerville, Suffolk, England, on April 2d last. She was the mother of F. M. Ogilvie, surgeon to the Oxford Eye Hospital and gave generously to that hospital also.

Prof. Dr. Hirschberg of Berlin has announced that his will provides for the presentation of his invaluable library of works on ophthalmology to the Berlin Royal Library with an endowment of \$1,000, the income from which is to be used for subscriptions to special journals dealing with ophthalmology and optics.

Mr. A. F. McCallan, chief ophthalmic inspector in the Health Department of the Egyptian Government, has received the Imperial Order of the Medjidieh, third class from the Khedive, for his services to his adopted country. He also has been given permission to wear the insignia of the order by King Edward VII.

Those who were fortunate enough to be able to attend the sessions of the Ophthalmic Section of the American Medical Associa-

tion, at Chicago, were well repaid with a very interesting and instructive program. The guest this year, Mr. E. Treacher Collins, of London, England, presented an able paper on the pathology of the lens and took a prominent part in the discussions. A dinner was tendered him at the Calumet Club by the Chicago Ophthalmological Society, at which Dr. Casey Wood acted as toastmaster, introducing the two speakers of the evening, Dr. Wm. H. Wilder, of Chicago, and Mr. Collins.

New Books

Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties. A manual of its practical application. By Willy Meyer, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital, and Prof. Dr. Victor Schminieden, Assistant to Professor Bier, University of Berlin, Germany. Illustrated. W. B. Saunders Company, Philadelphia and London, 1908.

This work on Bier's hyperemic treatment, while dealing chiefly with the general aspects of the subject, contains a special chapter on the eye, one on the ear, and an additional one dealing with the application to diseases of the nose and throat, and should prove of direct interest to specialists in these particular subjects.

Prevalent Diseases of the Eye. A reference handbook, especially adapted to the needs of the general practitioner and the medical student. By Samuel Theobald, M. D., Clinical Professor of Ophthalmology and Otology in the Johns Hopkins University. With 219 illustrations and 10 colored plates. Philadelphia and London, W. B. Saunders Company, 1906.

The above work is designed to be a practical treatise for the medical student and the general practitioner. It deals more particularly with the clinical side of ophthalmology than with the technical and objective tests, the author believing that the latter are beyond the ability of any but those specially instructed. The various external diseases of the eye, however, with relation to general conditions, are very thoroughly dealt with. The book is very thoroughly and practically illustrated in black and white and contains a number of colored plates.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|--|--|---|--|---|--|
| 9 A.M. | Richard S. Partillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Pol.) Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Pol.) Richard S. Partillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Partillo (P.G.) | G. W. Mahoney (Pol.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wipern (E.E.N.T.) | | A. G. Wipern (E.E.N.T.) | | A. G. Wipern (E.E.N.T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E.E.N.T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. A. Payne (Ils. Med.) N. E. Remmen (Inf.) F. A. Phillips (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tiven (N.W.U.) Alex. P. Horwitz (N.W.U.) L. B. Loring (P. & S.) F. K. Findlay (P. & S.) *Oscar Dodd (Inf.) |
| 3 P.M. | W. Allen Barr (C.C.S.) Wm. E. Gamble (P. & S.) | H. H. Brown (Ils. Med.) | *I. E. Harper (P. & S.) W. Allen Barr (C.C.S.) Wm. E. Gamble (P. & S.) | Burton Hazeltine (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.G.) |
| 4 P.M. | W. F. Coleman (P.G.) | C. W. Hawley (P.G.) | G. F. Suker (P.G.) | C. W. Hawley (P.G.) | W. F. Coleman (P.G.) | Brown Pusey (County) |

*Special operative eye clinics.

ABBREVIATIONS:

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|---|---|--|--|
| C. C. S.: Chicago Clinical School, 519 W. Harrison Street, E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | County: Cook County Hospital, W. Harrison and Honore Streets, Ils. Med.: Illinois Medical College, 182 Washington Bldg. Inf.: Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets. | Pol.: Chicago Policlinic and Hospi- tal, 174 E. Chicago Avenue, P.G.: Post Graduate Medical School of Chicago, 2400 Dearborn Street, N. W. U.: Northwestern University, 2431 Dearborn Street. | Rush: Rush Medical College, W. Harrison and Wood Streets, St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
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THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII

CHICAGO, AUGUST, 1908

NO. 8, NEW SERIES

SOME REMARKS UPON TUBERCULAR KERATITIS, WITH REPORTS OF CASES.

BY DR. WM. CAMPBELL POSEY.

Dr. Posey said that there is a growing conviction that many of the cases of interstitial keratitis which are not due to syphilis are of tubercular origin. Hippel, Zimmerman and others having found tubercular nodules with giant cells in the cornea of suspected cases and tubercle bacilli, though few in number have been observed in the giant cells. Bach has proposed the following clinical classifications: The *parenchymatous* type, attributed to the action of tuberculous toxins on the parenchyma; the *sclerosing* type, attributed to tuberculous disease of the pectinate ligament; keratitis of the corneo-scleral margin, unassociated with tuberculous disease of the iris or pectinate ligament, and corneal affections secondary to bacillary tuberculosis of the conjunctiva. *Sclerosing parenchymatous keratitis* is also described by him as being probably tuberculous in nature.

In the writer's experience the projection of a tongue-like area of yellowish-white infiltrate from the limbus into the interstitial lamellae of the cornea towards its center and the occurrence of discreet yellowish-white oval areas, which appear caseous and avascular, is very significant of tubercular keratitis, while he has observed the deposition of small rounded areas resembling drops of cold mutton fat upon the posterior surface of the cornea or in the lamellae of the cornea, secondary to tubercle of the iris and of the deeper parts of the eye. Doctor Posey referred to a case presented by him before the American Ophthalmological Society in 1904, of solitary tubercle of the iris, in which Descemet's membrane gave way under pressure from the tubercle, permitting the substantia propria to become invaded by the tubercular tissue.

The Calmette serum ophthalmo-reaction in the diagnosis of tuberculosis was also referred to by the writer, who quoted the words of Stephenson, that it "is a simple, trustworthy and practically harmless means of diagnosing tuberculosis in any part of the body." The same author's experience with the Calmette method

in 40 or more cases of ocular disease was also quoted. "The reaction caused no distress to any one of the patients. In almost every instance it was noted that the reaction involved mainly the lower palpebral conjunctiva, together with the lower half of the ocular conjunctiva, the other parts of the mucous membrane of the eye being relatively much less affected. In several cases, reaction was severe and lasted for a week or longer. Chemosis, however, was not observed. On several occasions, reaction did not supervene for 12 or 15 to 24 hours after the application. Speaking generally, a positive reaction was obtained in every eye case where there existed clinical evidences of tubercule."

Though Stephenson found the test to be harmless to the eye, a number of reports have appeared of alleged ocular injury from the diagnostic instillation of tuberculin. In this connection, the writer referred to DeLapersonne's recent paper, entitled "Is the Ocular Reaction to Tuberculin Dangerous for the Eye?" the conclusions of this author being that the ophthalmic-reaction is harmless for the eye, but that complications which are exceptionally observed, impose caution in its application. It is wise never to instil tuberculin until after a thorough examination of both eyes. Doctor Posey reported three cases of tubercular iritis, which were under his observation at the present time, in all of which general and local reaction followed sub-cutaneous injections of tuberculin, reaction being obtained in one instance, a boy of 12, with 1.50 mg., in another, a male 25 years old, with 3 mg., and in another, a female of 20, with 5 mg. One of these cases and a fourth reported by him showed the cold mutton fat globules scattered through the posterior layers of the cornea.

Albert Philip Francine, A. M., M. D., by invitation, called attention to the fact that the potency of a given solution of tuberculin was within certain limits an unknown factor, as the only method of standardizing it was a clinical one, and that therefore without wishing to question the efficiency of tuberculin as a therapeutic and diagnostic agent, a certain amount of doubt must attach itself to its use. It was impossible to standardize this product on animals, and the only method at present available was its clinical manifestations on the human subject. This was true of practically all the specific vaccines, with the exception of diphtheria antitoxin. This latter differed further in being a serum and in producing a passive immunity in contradistinction to an active immunity. To illustrate his point, Dr. Francine said that he had received a supply of tuberculin from a well known and

highly reputable firm of manufacturing chemists for the purpose of standardization, and upon testing it in his tuberculosis wards at Blockly had found it to be absolutely inert.

He further spoke of the hypodermic use of tuberculin as a diagnostic agent to which Dr. Posey had referred, and deplored the large doses sometimes employed. The best method seemed to be to begin with 0.5 mg. old tuberculin, and if no reaction followed this initial dose to repeat it after three or four days, particularly if any symptoms of a mild reaction has occurred. If the temperature showed any irregularities, a longer period should be allowed to elapse and the same dose repeated a third time. But in the absence of any reaction at all, the third dose may be increased to 1.25 mg. Finally a maximum dose of 2.50 mg. may be given. But he emphasized the importance of repeating the same dose, as a merely suggestive reaction after the first administration, may be followed by severe symptoms after the second dose.

In relation to the ophthalmic reaction, he spoke of the possibility of legal complications arising if a patient chose to be disagreeable. There was the danger of unexpectedly severe reactions, which might prevent a patient from working for two or three weeks, and there was also the possibility of neurasthenic subjects claiming that the eye had been injured. There seemed also the rare possibility of infecting the eye in the event of the tuberculin solution having become contaminated with pathogenic bacteria. He was interested in hearing Dr. Posey speak of permanent damage done through the use of this test, from the literature.

He spoke of Baldwin's technic at Saranac, in the use of this test, and of the latter's opinion that reactions with a solution of stronger than 0.5 per cent were of doubtful diagnostic value. He suggested that it would make a difference as to the likelihood of a reaction as to whether the in-tillation was made at the time of a positive or negative phase of the opsonic index, as in the former case a reaction might occur which might be absent in the latter. Finally, from his own experience with the test, he was inclined to consider it, while probably not pathognomonic yet highly significant.

Dr. Zentmayer: It is a fallacy to conclude that an ocular lesion is tuberculous because the patient reacts to tuberculin, as such reasoning precludes the existence of a tuberculous lesion elsewhere in the organism. The frequency with which old foci are found in the lungs in post mortem examinations shows that such

exclusion is not warranted. Again the large doses sometimes employed might of themselves excite a febrile reaction. After all the only conclusive test is that of inoculating a susceptible lower animal with some of the new-formed tissue.

Dr. Ziegler spoke of his experience in the use of old tuberculin in three persons in whom there were local and certain general manifestations, as of enlarged cervical glands. He found old solution to react in small quantities administered at long intervals, and in time recovery followed. In one case there have been no signs for two years; the second, for one year, and the third for nine months.

Dr. Risley called attention to the likelihood of the solution containing some infective substance which might cause chronic disease of the conjunctiva, so that this promised valuable diagnostic agent might prove unsafe. He too makes full examination of the eyes and records the vision before he makes the test. And, he said, when instituting this diagnostic and therapeutic course it would be wise to enter into a mutual relation with the patient and ourselves in order that the patient may have an intelligent conception of the object before us. He cited an instance where backache and high temperature followed the first injection and the second, thirteen days later. The third injection produced a slight reaction, and then the patient refused further experiment, because, as he said, his teeth had become loose and he had persistent backache.

Dr. Posey said in closing that Dr. Zentmayer was right when he said he would accept only inoculation as final proof. He had found the solutions offered by a local manufacturer practically inert, and so had Dr. Risley. That put out by the Pennsylvania State Board had yielded good results. He had not had the opsonic index studied in his case.

COMPLETE PERIPHERAL CAPSULOTOMY.

By FRANCIS VALK, M. D.

Professor of Diseases of the Eye, New York Post Graduate School and Hospital.

It may be an old story to come before the readers of this paper with any suggestions in reference to the major operation on the eye, that is, the removal of the sclerosed lens in senile cataract or in any other form of opacity of the transparent lens. Yet ophthalmology, as it is a true science, cannot stand still and any deviation from the old routes, in the line of a new procedure may be of certain interest to all operators on the eye. Our text-

books, so-called, seldom give to us the personal experience of the writers but a general description of the operation both simple and combined with very little difference in the technique or methods of operating. Various methods have been suggested for the section of the cornea, some prefer it completely within the limbus, that is to say, completely within the corneal tissue, others make the section partly in the corneal tissue and partly in the sclera and still others in the scleral tissue alone. Then we have the section with the conjunctival flap that is supposed to prevent a prolapse of the iris and to secure prompt and secure healing. To place myself on record I prefer a section, completely within the corneal tissue, which has been given the name "shoulder incision" by some one. I do not know the name of the operator who suggested this incision, as it has only been stated that "some operators" advocate it. Nor do I know when or where I myself learned to make this incision, but I have always performed it in my cataract operations and with what seemed to me excellent results as to the rapid healing of the wound and the ready exit of the lens. As I perform this incision we have no "to and fro" movement but two distinct and clean cuts on each side of the cornea, that is to say, on the peripheral part of the upper nasal and temporal quadrant of the cornea and then the knife is turned on its long axis and the superior peripheral part of the section is completed by one clean cut. This "shoulder" or as I have always stated it, this cut makes the cornea form a "keystone of an arch" and so advances rapid healing by the close approximation of the edges of the incision and with much less tendency to a prolapse of the iris.

We now come to the subject of this paper or the next step in the operation for cataract after the section has been made, the capsulotomy. Here we find many ways for cutting or lacerating the anterior capsule of the sclerosed lens and, in the ordinary section of the capsule, suggested by certain operators, they simply aim to tear or to scratch some sort of an opening in the capsule without regard to any special design and in the language of the street, "let it go at that." Others advise a quadrangular incision, but if this square incision is made of any size we have always the danger of wounding the pupillary edge of the iris by the sharp edge of the cutting part of the cystotome. Now for some years I have made what Knapp of New York calls a peripheral incision, that I like very much, but, with the sharp edge of the minute knife on the distal end of the cystotome, if we make a large incision

in the capsule we are again in danger of wounding the pupillary edge of the iris. I will describe the method in Knapp's own words: "He then advances the knife until the tip goes under the iris, turns it and with the tooth makes the incision into the upper part of the capsule parallel with the corneal incision about six or seven millimeters in extent."* The cutting of the capsule of a cataractous lens is always a delicate procedure and one which the novice has much difficulty to understand as he is told to cut, yet does not seem to cut. A student at the New York Post-Graduate School and Hospital tells me that at his first operation for cataract he could not understand why he did not feel any resistance to the movements of the cystotome, and so made three supposed attempts to cut the capsule. Now in all capsulotomies we must simply remember the anatomical parts and the relative position of those parts and then proceed to place the cystotome in the correct position. We then move the distal end of the instrument as we wish to make a section in the capsule without the slightest pressure and without the slightest sensation of any resistance as we perform this step in the operation. In this connection we may note the physiological condition of the anterior capsule, which I will quote from Norris and Oliver's System, Vol. 1, p. 201: "It is also very brittle and if scratched or cut with a sharp instrument readily tears, breaking like thin glass along irregular angular lines. Its cut edges always roll outward." It is very evident from this that it is not necessary to use a knife blade to sever or open the capsule of the lens, but that any sharp pointed instrument that will first pierce the capsule will then break it as the instrument is moved about in the field of operation. From these conditions and noting that a too extensive motion of the cystotome, as now used, was liable to wound the delicate pupillary edge of the iris, tending to a possible after coming iritis. I have devised and had made for me by Meyrovitz this modification of the cystotome, by which



We can move the instrument to any part of the field of selection without, in any degree, injuring the delicate structure of the iris.

The Needle Pointed Cystotome.

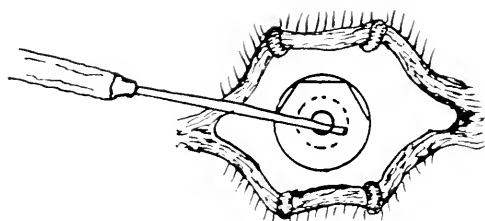
It will be noted that this instrument consists of the usual Candler with a long rounded and straight shank terminating in a

* See O. G. System, Vol. III, p. 108.

needle point, smooth and rounded on the sides and placed at right angles to the straight shank. After the section is made it is easily introduced into the anterior chamber to the center of the pupillary space. The handle is then rotated so that the needle point will be directed downward.

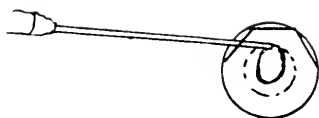
Drawing of the Positions.

It is now carried to the first position, as shown in the drawing, about two millimeters beneath the pupillary edge. We now make a complete circle as the needle point takes the several positions as shown until it returns to the first position when it is again



First Position. Point of Cystotome turned inward.

rotated and slowly withdrawn. It will be noted that as the needle point passes upward, outward and downward it carries the corresponding part of the iris with it, pushing the pupillary edge to one side, but as this needle point, on all sides which come in contact with the iris, is perfectly smooth it will not scrape or irritate the delicate pupillary edge of the iris in any way, consequently there is very slight danger of a following iritis or the need of an operation on the capsule afterwards. I have been



Second position.

unable to note if the central portion of the capsule finds its exit with the lens, but it probably does. It is self evident then that by this method we should not have any small portions of the capsule to be caught in the section to prevent healing, nor can we have a dense capsular cataract remaining after the exit of the lens when the anterior central part has been removed. As to the

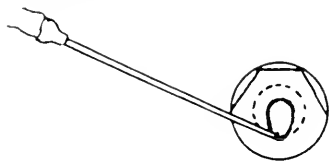
technique of this procedure it seems to me that it is as simple, if not more so, than the usual method of cutting the capsule with the minute knife on the distal end of the ordinary cystotome.

I have now operated in this manner several times and it has seemed to me that by this method of complete peripheral cap-



Third position.

sulotomy we can make the *simple operation* for senile cataract a *simple operation*, as in all my cases I have been pleased with the easy exit of the lens always leaving a smooth round and black pupil. Furthermore, from my records of these operations it has seemed to me that I have had much less necessity for the secondary operation on the capsule, an operation which our patients seemed to dread much more than the extraction, certainly since I have



*Fourth position=
from this position back to first.*

used this instrument I have not found it necessary to do the secondary operation for cataract. A new method of this kind requires many operations to fully prove its usefulness and many of us prefer to follow our old lines of work rather than to fly to those that are new, but this procedure is simple in its mechanism and easy to perform, hence it may be offered to the profession with some confidence of a slight approval.

ON THE PROTECTIVE INFLUENCE EXERTED BY THE IRIS IN PERFORATED WOUNDS OF THE CORNEA.

By FRED T. TOOKE, B. A., M. D.,

Associate in Ophthalmology, Royal Victoria Hospital; Assistant Demonstrator in
Ophthalmology, McGill University, Montreal, Canada.

That injuries of the eye occur more frequently in the cornea than in all its other parts combined, is a fact equally important and interesting for consideration to the general practitioner, the

ophthalmic surgeon, and the pathologist; and this interest is augmented if one considers the various efforts made at repair in corneal traumatism.

It is not my intention to enter upon the causes of corneal perforation, nor to attempt to explain how perforation and subsequent infection of the globe is produced. This has already been done by Leber* in his memorable work on the production of inflammation. The object of this paper is really not one relative to the production of inflammation, but to point out the protective influence exerted by the iris in perforated wounds of the cornea. In considering this point two important features have to be regarded: (a) The poor nutritive supply of the cornea, consisting, as it does, of a purely lymph stream: a stagnant and comparatively inadequate circulation doing service for the tissue which is most frequently injured. (b) The rich vascular supply of the iris, practically consisting as it does of a plexus of vessels which are capable of delivering an abundant supply of leucocytes to the part.

With these points in view, one may consider what occurs when perforation of the cornea takes place. After the escape of the aqueous humor, the iris is irresistibly drawn forward into the wound, and by this act three important results may be brought about:

1. The wound of the cornea is frequently of an infective nature, be it a perforated ulcer or a perforation due to the entrance of a foreign body. By walling off the infected sides of the incision an effort is made to ward off the entrance of bacteria into the anterior chamber and to avoid subsequent panophthalmitis. Beyond this purely mechanical action the blood vessels of the iris assist in carrying off the localized infection to the general circulation, thus preventing subsequent necrosis of the cornea.

2. A second feature, noted by the presentation of the iris, is that the process of actual healing or of granulation tissue formation is materially assisted; that after draining away the infective agencies, the number of leucocytes supplied by the blood vessels of the iris readily assist in the formation of new connective tissue elements. This tends to permanently close the perforation, and allows of the reformation of the protective epithelial strata of the cornea.

3. Besides completely filling the gap in the cornea and pre-

*Die Entstehung der Entzündung. Leipzig, Englemann, 1891.

Read before the Canadian Medical Association, Montreal, September 13, 1907.

venting any escape of the aqueous humor, the anterior chamber is restored and the intra-ocular circulation re-established.

This whole process, as Professor Adami suggests, may be compared in detail to a provision of nature at another focus. In conditions of perforation of the appendix vermiformis with abscess formation a similar attempt is often made by the omentum to wall off the infection. That this attempt is very frequent, and fortunately, commonly successful, is a fact that does not require repetition. The comparison of the attempt made by the iris to avoid generalized infection is made all the more emphatic by considering the exceedingly rich vascular supply of the two membranes. One must also consider in regard to the richness of these two highly vascular membranes, that with the slightest irritation an abundant supply of fibrin is exuded from the vessels, tending to hold the membranes in close apposition to the injured structures, which they are endeavoring to protect before actual fibrosis or new connective tissue formation has taken place.

That the effort on the part of the iris is frequently an attempt of a suicidal nature, all who have had any experience in eye surgery will admit. The iris frequently becomes pinched in between the lips of the wound and is further irritated by being constantly drawn upon through the action of the iris fibres, coincident with the process of accommodation. It cannot be denied that many lamentable results are avoidable by performing an iridectomy or by releasing the anterior synchia. Other cases, however, do not present favorable opportunities for operative interference; when the entanglement of iris is near its root, in the neighborhood of the ciliary body, it cannot be released without further injury to the globe and additional irritation to the uveal tract. A subsequent enucleation of the globe is consequently rendered necessary at times, not only on account of the pain but from a persistent traumatic irido-cyclitis threatening sympathetic ophthalmia, rather than from panophthalmitis, the result of a definite micro-organic infection.

As pathologist to the department of ophthalmology at the Royal Victoria Hospital, Montreal, I have come upon two cases within the past year which bear out these points particularly well. Both had sustained injuries about two weeks before enucleation was deemed advisable.

Case 1. (Fig. 1.) A condition of perforation at the center of the cornea, produced by a sharp instrument. The eye was re-

moved on account of pain and as a safeguard against sympathetic trouble in the other eye. Microscopically one sees that the perforation has occurred practically in the center of the cornea, and one can also notice that both ends of the pupillary margin of the iris are presented into the incised wound.

Where one side of the iris is inserted one can observe that it is adherent to the cornea anteriorly for a distance of about half its length and posteriorly to the lens capsule. The iris has been actually inflamed and a marked round celled infiltration has established new connective tissue formation binding the iris firmly to the cornea in front and to the lens capsule behind. This condition, with the attendant marked infiltration of the iris tissue, more par-

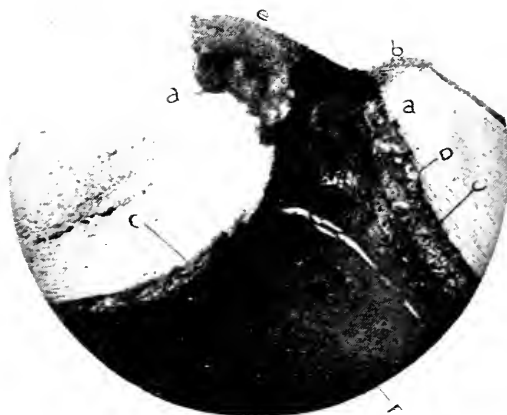


FIG. 1. a. Absence of Infiltration near Wound in Substantia Propria.
 b. Regeneration of Corneal Epithelium over Lip of Wound.
 c. Iris.
 d. Blood Vessel in Iris.
 e. Slough over Point of Perforation.
 f. Infected Cataractous Lens.

ticularly at its pupillary end, is very beautifully shown. Some of the lymphocytes from the iris have been thrown free into the anterior and posterior chambers at the filtration angles. This infiltration extends to a less marked degree into the ciliary body of the same side. The anterior chamber proper is remarkably free from leucocytes.

As I have already remarked, the cornea has been perforated at about its center and one side of the wound has been walled off by that part of the iris just described. The superficial corneal

epithelium can be seen to have been not only restored over Bowman's membrane, but to have proliferated quite deeply into the wound making an excellent effort to cover that part of the substantia propria where the lips of the iris are presenting. The lips of the wound are practically composed of sloughed iris cells with an enormous quantity of leucocytes of various types. The substantia propria of the cornea is remarkably free from infiltration or necrosis, the effort of the iris seemingly having been sufficient not only to prevent the infection from invading the corneal cells to any appreciable degree, but to have successfully inhibited the entrance of bacteria into the anterior chamber.

The other lip of the iris presents a very similar picture. The

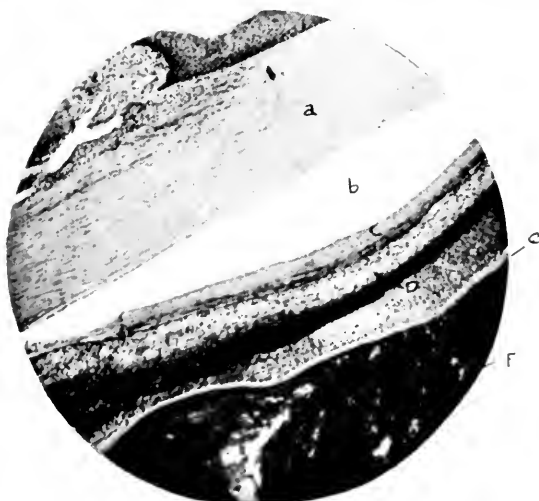


FIG. 2. a. Clear Substantia Propria Cornea.
 b. Clear Anterior Chamber.
 c. Lymph Formation over Anterior Layers of Iris.
 d. Infiltration of Iris Tissue.
 e. Lens Capsule.
 f. Cataractous Lens.

basement pigment layer, however, has been thrown off at a number of points and some of it has been scattered in the slough formed at the point of perforation. A similar degree of infiltration of the iris tissue can be distinctly seen, the inflammation being, perhaps, even more intense, while a number of the dilated blood vessels are quite clearly shown. The cornea has been absolutely protected by the iris at this point, as can be seen by the absence of leucocytic infiltration of the substantia propria.

The feature of the highly vascular nature of the iris has been very clearly brought out in some of the sections, the structure being

shown to consist largely of a chain of tiny engorged blood vessels. These vessels have been brought practically into contact with the corneal tissue proper and it is remarkable how absolutely free from every evidence of infection that part of the cornea is which had been walled off by this vascular membrane. That the perforating body after penetrating the anterior lens capsule has subsequently produced an infected traumatic cataract is very clearly shown (Fig. 2). The protective influence of the iris preventing the spread of infection is emphasized still more strongly at this point; the nature of the lens fibers and the tough, resisting nature of the lens capsule of course being taken into consideration as affording material assistance to the resistance exerted by the iris.

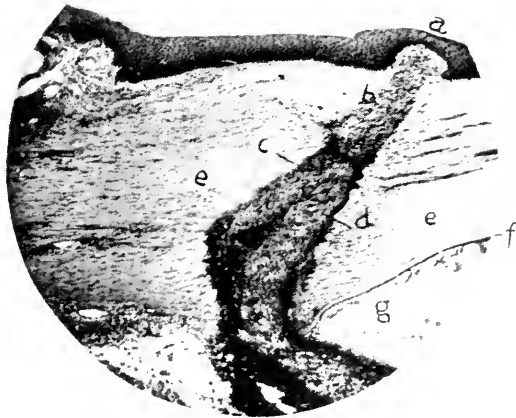


FIG. 3. a. Regeneration of Corneal Epithelium over Point of Perforation.
 b. Scar Tissues.
 c. Infiltrated Iris with Scattered Pigment Cells.
 d. Blood Vessel in Iris.
 e. Clear Substantia Propria.
 f. Rupture of Descemet's Membrane.
 g. Absence of Pus in Anterior Chambers.

Case II. (Fig. 3.) This patient was struck in the eye by a splinter of stone, the foreign body penetrating the cornea 1 or 2 mm. from the scleral margin; it could not be extracted. Chronic iridocyclitis was set up and the eye was removed on account of pain as well as out of consideration for the healthy eye.

Sections were made of this as of the previous case and in many respects, though perhaps to a less marked degree, a similar condition of affairs is presented. The cornea is seen to be cut through in a somewhat oblique direction, slightly ragged but fairly

regular. The incision has been complete, penetrating the whole of the substantia propria and Descemet's membrane, cutting through the iris at its root, where it joins the ciliary body. The ciliary end of the iris has been drawn up into the wound and completely occupies its lower two-thirds. It is clearly demonstrated that the presentation of the iris at this point has, as in the former case, produced a practically similar result. The walls of the incision, although somewhat ragged, are infiltrated, but to a very slight degree; the infective process, however, has not reached the substantia propria.

On examining the wound by high power, the presenting segment of iris can be seen to be tremendously infiltrated with small round cells; that the pigment layer has become disintegrated and scattered through the iris and connective tissue, and that tiny blood vessels are playing very much the same role as they did in of the former case. The whole of the iris is very markedly inflamed, the process being evinced by a tremendous infiltration of leucocytes in the iris tissue, some of which have been thrown out into the anterior and posterior chambers by a number of engorged vessels in that part of the iris held between the lips of the wound as well as that part lying free in the anterior chamber; and by the presence of several synechie situated between the pigment layer of the iris and the anterior lens capsule. The ciliary bodies show a condition of inflammation of low intensity, a tremendous quantity of leucocytes being thrown out from both ciliary processes into the vitreous cavity giving rise to subsequent new connective tissue formation which has practically completely shut off the lens from the rest of the vitreous chamber; there is, however, no such thing as panophthalmitis and vitreous abscesses do not exist. One can see that with the exception of the few leucocytes thrown out by the attendant iritis, the anterior chamber is absolutely clear.

With the involvement of the retina and choroid, as shown by the very marked infiltration of the several layers of the former and the slight perivascularitis of the distended choroidal vessels and displaced choroidal pigment, a condition of generalized uveitis may be said to exist. One may explain this condition as a generalized irritation and attribute its existence to one of two causes, or probably to a combination of the two; the irritation exerted upon the iris, and consequently upon the whole uveal tract, extending from that part included in the lips of the corneal incision, or, from the irritation exerted by the foreign body which has lodged in the ciliary process, producing and maintaining a persistent form of irritation.

The force of my arguments will be substantiated by considering an example where the reverse has been the case (Fig. 4). The cornea was perforated by a splinter of steel three days before evisceration was deemed advisable; the cornea was excised, and the contents of the globe were carefully and thoroughly removed. The

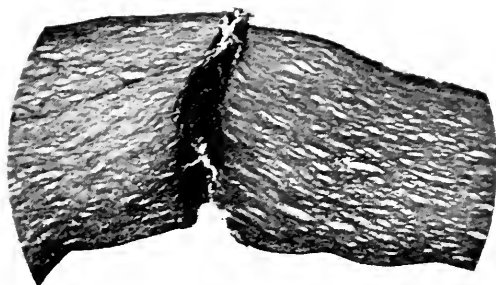


FIG. 4. Septic Wound of Cornea.
 Space between Lips of Wound Occupied by Pus.
 No Effort at Repair of Corneal Cells.
 Contortion of Corneal Cells.
 Dilatation of Intercellular Spaces, Intercellular Spaces Filled with Leucocytes.

aqueous and vitreous chambers were filled with pus. Microscopic examination of the excised cornea shows a fresh wound where absolutely no effort at repair has been made; the space between the lips is occupied by a mass of pus cells. The corneal cells are distorted, particularly below, the intercellular spaces are very much dilated, and are occupied by a decidedly marked infiltration of leucocytes. It is reasonable to conclude that this condition of affairs has not been avoided owing to the fact that presentation of the iris did not occur.

TRANSLATION.

ON THE FILTERING CICATRIX IN THE CURE OF GLAUCOMA.*

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In this communication we shall discuss the following four points:—I. The utility of the filtering cicatrix, and the impossibility of obtaining the latter without scleral resection; II, the definitive formation of such a cicatrix after the performance of the operation devised by us; III, the different forms of filtering cicatrix; and IV, the causes which lead to variations in the form and external aspect of the filtering cicatrix.

I.—The Utility of the Filtering Cicatrix.

Is the filtering cicatrix useful in the treatment of glaucoma? This question must be answered in the affirmative, no matter what views we may hold with regard to the pathogeny of the disease. If one believe that glaucoma is the consequence of too much fluid, it can scarcely be denied that its evacuation will be useful. If one believe that glaucoma results from retention of fluid secreted in normal quantity, it must be equally serviceable to clear the chief outlet by means of which the fluid escapes. It is, indeed, probable, and for that matter, to my mind, certain, that the primary cause of glaucoma is hypersecretion, due to: (1) a nervous disorder (excitation of the sympathetic); and (2) an alteration in the blood or the vessels (sclerosis). One of these factors may suffice, but when they act together, the effect is so much the greater. That is the principal cause, to which there is speedily added another of capital importance, namely, the obliteration of the excretory channels—closure of the angle of the anterior chamber, *soudure* of Knies, obliteration of the lymph-canals surrounding the vasa vorticiosa, strangulation by the sclera, hardened in those who suffer from rheumatism, sclerosis, and so forth.

In every case, whatever be the cause of the glaucoma, a filtering cicatrix giving issue to fluid will be curative, as much as any operation can be, since if there is glaucoma there is hypersecretion or retention, and in either hypothesis it is equally useful to evacuate the fluid which encumbers the eye. This is the reason why almost all the interventions devised for the relief

*Reprinted from the *Ophtalmologie*, Vol. 1, p. 8.

of glaucoma aim at facilitating the excretion of fluid—iridectomy, sclerotomy, and all similar and substitutory operations have been recommended in the hope of obtaining this result.

Undoubtedly, all operators do not agree upon the way in which this or that operation acts upon the diseased process. We know that certain surgeons explain the action of iridectomy otherwise than by the filtering cicatrix. We are familiar with the theories of Abadie (*Archives d'ophtalmologie*, 1897), Jœqs (*La Clinique Ophtalmologique*, november, 1900), Rochon-Duvigneaud (*La Clinique Ophtalmologique*, 1901, p. 17), and some others, although, candidly, we cannot understand why they seek the reduction of tension in any cause other than the state of the cicatrix, seeing that the permeability or otherwise of the latter explains perfectly successful as well as unsuccessful results.

In acute glaucoma, iridectomy by the rapid evacuation of liquid that is in excess, causes the œdema of the uveal tract to disappear, by means of which Nicati (*Société de Biologie*, 1890) and Albert Terson (*Société française d'ophtalmologie*, mai, 1901) have explained this variety of glaucoma. Cicatrization of the wound takes place under pressure, with the consequence that the wound becomes ectatic enough to allow of the filtration of fluid. The cicatrix is the more permeable, since the operator, despite himself, often leaves a bit of the iris caught up in the wound, thereby separating the lips of the latter.

In irritative and chronic glaucoma, with raised tension, it is also the cicatrix that explains the success, longer or shorter, of the iridectomy. The eye being under strong pressure, the coaptation of the wound is imperfect, and even when the iris is nowhere incarcerated, the cicatrix becomes somewhat thinned and ectatic. It is more or less "filtering," exactly in proportion as the lips of the wound are separated at the moment when cicatrization takes place.

In chronic glaucoma, with moderate tension, the surgical cicatrix becomes hardened and thereby loses the possibility of allowing fluid to escape. In cases of chronic glaucoma, where hypertension is feeble and inconstant, the scleral incision closes hermetically from exact coaptation in the first few days.

From what has been said, it follows that the filtering capacity of the cicatrix depends directly upon the degree of hypertension of the eye that has been operated on, and that the iridectomy will be so much more efficacious the more distended the eye. The operation yields definite results in acute glaucoma: good results

of a more or less lasting character in glaucoma, with more or less hypertension: but it is without value in cases where hypertension is little pronounced. Is it not evident that the value of the operation is exactly proportional to the hypertension of the eye, to the separation of the lips of the wound, and to the variable degree of ectasia that results from the last-named?

Since the results given by iridectomy can be readily understood by what happens in regard to the cicatrix, I fail to comprehend why we should go in search of doubtful, uncertain, and hypothetical explanations.

The conclusion follows, that the best operation for glaucoma is precisely that which allows of the freest possible escape of the intra-ocular fluids.

v. Graefe understood the usefulness of the filtering cicatrix, and he explained the good results in many of his cases by its action, but to de Wecker attaches the credit of having brought into prominence the value of this cicatrix (*Société française d'ophtalmologie*, 1901, p. 34). When one studies with care the admirable communications of our regretted colleague, it does not take long to perceive that, while demonstrating the advantages of this cicatrix, he places in relief not only the difficulty, but also the impossibility of obtaining filtration in the great majority of cases.

Let us see what de Wecker's principal publications say on this subject. "Study with the *loupe* of young subjects who have been operated on for glaucoma constantly shows differences of level where the least prominent parts affect the crateriform character with a darker and thinner base" (*loc. citato*). For de Wecker that constitutes the type of the filtering cicatrix: the cystoid cicatrix is for him an insufficient cicatrix, since it includes more or less marked entanglements of the iris, and these entanglements entail, among other inconveniences, that of suppressing filtration at their site. He therefore thinks, rightly enough, that one should not endeavor to obtain a filtering cicatrix by means of a prolapse of the iris, as has been done by Bader, Herbert, and lastly, by Holth, of Christiania.

The filtering cicatrix obtained without entanglement of the iris gives an excellent result, and everything said about it by v. Graefe and by de Wecker still remains true. But when one reads communications about this question we are struck with two main facts: (1) when there is no entanglement of the iris, a filtering cicatrix is produced only when the tension of the eye is notably raised; (2) when the cicatrix is produced in such

eyes, it loses, little by little, its power of filtration, as it grows older and harder.

This is equivalent to saying that the filtering cicatrix cannot be obtained at all in simple chronic glaucoma, while the function of the cicatrix obtained in chronic glaucoma with hypertension disappears more or less quickly with the lapse of time.

The proof of what I say is to be found in de Wecker himself: "It is to be remarked that when the wound cicatrises under normal tension, a rigorous consolidation of the lips of the section takes place: that is what happens in cases of simple chronic glaucoma, and the action of iridectomy under such circumstances becomes less and less efficacious."

It is somewhat singular that in these conditions the idea of excising a scleral flap did not occur to the mind of our eminent *confrère*.

Moreover, de Wecker in another communication (*Annales d'oculistique*, 1905, p. 131, T. CXXXIV), justly remarks that the effects of iridectomy diminish with time, inasmuch as the cicatrix contracts, and thereby becomes less efficient as a filter. That is the reason why cicatrixotomy or ouletomy has been advised, and also why Dianoux (*Annales d'oculistique*, février, 1905) and Wickerkiewicz (*Annales d'oculistique*, 1905, p. 131, T. CXXXIV) have recommended massage, the former after sclerotomy and the latter after iridectomy. The advice is good: but massage has no action except on recent cicatrices, while the section of a cicatrix has, ere long, the same sort of effect as the former operation.

Much has been written to prove that there is no filtration at the site of old scleral and corneal sections. The experiences of Schoeler (*Berliner klin. Wochenschrift*, 1881, No. 36) on rabbits, histological examinations, and numerous pathological sections prove that there is nothing to hope from any kind of scleral section as regards the lasting filtration of the ocular fluid. Our own experiences upon rabbits have led us to form similar conclusions.

Experiments on animals do not allow us to reach conclusions as to what passes in man whose eye is hypertended, since the animal's eye is under normal tension. At the same time they show what takes place in simple chronic glaucoma, for in the rabbit the lips of the wound become hermetically sealed.

What has been said so far may be summed up in two sentences:

(1) The filtering cicatrix resulting from iridectomy is the direct outcome of the elevation of tension: when tension is normal, the cicatrix does not filter at all; it filters for a longer or a shorter time according as the tonus is more or less raised.

(2) When a filtering cicatrix is obtained in a hypertended eye, it loses its properties in proportion as the cicatricial tissue contracts and hardens: from this it follows that the value of iridectomy (which amounts to nothing in chronic glaucoma with feeble and intermittent tension) has a transitory value only in the other forms of chronic glaucoma.

Iridectomy has no value, or but a passing one, because the lips of the wound fall into apposition, either immediately after the incision or more or less quickly after the section has been made. Diuresis must be replaced by exeresis, since by the former it is impossible to produce a definite filtering cicatrix, which, on the contrary, one can get readily by exeresis of the sclerotic.

In that lies the end and the aim of my operation for glaucoma.

My operation of sclerecto-iridectomy (for description see *The Ophthalmoscope*, September, 1907) has the primary advantage of opening up a communication between the choroidal space, on the one hand, and the aqueous chamber, on the other. It satisfies, therefore, the wants of those who believe that chronic glaucoma largely depends upon the obliteration of that space. In the second place it does away with the obstruction of the angle of the anterior chamber, when such exists; and, lastly, it establishes a communication between the aqueous chambers and the peri-choroidal space and the meshes beneath the conjunctiva.

A similar scleral incision gives but a fleeting result, because the lips of the scleral wound unite by first intention, and thereby effectually block the escape of more fluid from the eye. On this point we have the assurance of de Wecker, as already quoted in this article.

Thanks to exeresis of the sclera, we need no longer fear occlusion of the lips of the wound, even when tension is normal. If to that we add that the lips of the wound are unable to pout, the scleral tissue being immobilised in its form, one can understand that the orifice becomes transformed naturally into a tiny fistula, the wall of which is perpetually swept by the excreted liquid.

We may conclude that most surgeons who have devised operations for the cure of glaucoma have aimed at facilitating the excretion of liquid, and that most of them have endeavored to obtain a filtering cicatrix. Thus they have not managed to get at all in

simple chronic glaucoma, while in chronic glaucoma, accompanied by hypertension, they have obtained it only in an imperfect and non-lasting manner.

In that way we explain surgical failures in the treatment of glaucoma. We shall endeavor now to show that our operation is capable of yielding in every case, and without danger, the filtering cicatrix so necessary to cure.

II.—The Formation of a Filtering Cicatrix After the Operation of Combined Iridectomy and Sclerectomy.

Historical researches will doubtless one day explain exactly how the cicatrix formed after my operation comes about. Such studies will be made upon eyes removed years after the operation has been performed, or upon the eyes of animals that have been subjected to experimental study. Chance will probably place specimens of the first class in our hands. As to the second possible source of material, we shall be able before long to study the eyes of dogs on which our operation has been performed recently. In the meantime we will place before our readers the different type of filtering cicatrix obtained by the procedure.

We employ here the expression "filtering cicatrix," because it is the only one which agrees with the anatomical state of the region operated on and with the results obtained. We do not understand the objections offered to this terminology, coined by de Wecker, even at the beginning of his memorable work. The operation consists in the formation of a breach accompanied by a wound. As this wound heals, it is difficult to deny that it cicatrises, and, as elsewhere, the cicatrix thus formed allows the intra-ocular fluids to escape more readily than usual. It is, therefore, impossible to refuse to add the epithet "filtering" to the term "cicatrix."

We believe, then, that the term should be retained, and that it may conveniently be applied to all the results given by the combined operation of iridectomy and sclerectomy. These results differ according to the cases, to the extent of the sclera excised, and to the state of the eyes operated on. They also differ with regard to the appearance of the cicatrix as much as they do with regard to its intimate structure. All agree, however, in this, namely, that the intra-ocular liquid passes away more readily through the breach in the sclera than it did before the operation.

Doubtless, it would be most interesting to demonstrate anatomically and experimentally that such a cicatrix allows of the

filtration of fluids, the more so since, as already stated, such a property has been denied to corneal and scleral cicatrices.

Henderson, of Nottingham, has written an interesting paper for the purpose of demonstrating that incisions in the eyeball close in such a way that no issue of liquid is possible, and *à propos* the communication which we made at the Oxford Ophthalmological Congress (July, 1907), he insisted upon this impossibility.

Our English *cofrère* is right. We are in accord with him as to what follows a simple section of the sclerotic. de Wecker, it is true, attempted for thirty years to attain a filtering cicatrix without success, and Diamoux, in order to secure an appreciable and prolonged escape of liquid, was obliged to practice massage daily. The massage acts as long as the walls of the incision are but slightly adherent, but after some weeks or months, it has no longer any effect. Henderson is right; after none of the known means, can we, by incision of the globe, obtain a persistent and filtering cicatrix?

Such a cicatrix can be obtained only by making not a diæresis but an exeresis of the sclera. It is another thing to make in the wall of a pocket distended, as is the eyeball, an incision or an excision. If one takes a hollow ball of caoutchouc and makes in it an incision of some millimetres, the ball retains its shape, and the lips of the cut fall into such an exact apposition that the line of incision can scarcely be recognized. When one lip of the incision is excised, however, the tonicity of the elastic ball ensures that the borders of the incision remain separated, and renders coaptation impossible.

This is what happens as regards the eye, the more so since the lips of the wound are not able to sprout so as to come into contact one with the other, since we have to do with a loss of substance in the sclera, a fibrous tissue, which does not proliferate. In this way one can understand why a definitive filtering cicatrix is formed at the level of the sclerectomy. This filtering cicatrix is not without analogy with the cystoid cicatrix, so well known to operators, although the analogy is more apparent than real.

The two kinds of cicatrix differ essentially in the following points: (1) the filtering cicatrix which results from the combined operation of iridectomy and sclerectomy is free from any adhesion to the nveal tract; (2) the cystoid cicatrix, on the contrary, is always consecutive to an entanglement of the iris.

The entanglement of the iris is the *raison d'être* of the cystoid cicatrix, and it is precisely because the cicatrix involves the nveal

tract that it is rightly dreaded both by the surgeon and the patient. At the same time, it must be admitted that it often has a good effect as regards hypertension and glaucomatous relapses. The patients who present a cystoid cicatrix have a normal ocular tension, and in their case the surgical intervention has had a relatively favorable result. Speaking generally, they are better off than those upon whom a very regular iridectomy has been made, for an exact closure of the wound follows the perfect iridectomy, while when the iris is caught up, the lips of the incision gape, and allow the fluid of the anterior chamber ready access to the subconjunctival meshes. The entanglement, however, if it offers the advantage of causing the lips of the wound to gape, also exposes the patient to all the dangers of prolapse of the iris, and all the risks of recurrent inflammations of the uveal tract.

We have recently had under care a woman, both of whose eyes were operated upon for chronic glaucoma by an eminent *confrère*. Her history, which we shall relate briefly, is very suggestive not only as regards the inadequacy of iridectomy, but also as regards the inconveniences of entanglement of the iris. To begin with, the patient complained of her right eye, which caused her much pain, was often reddened, and was almost always somewhat tender. It was on account of this eye that the patient consulted us. The sight of the right eye was two-thirds, while that of the other eye was one-fifth only. As is often the case, the patient did not know exactly which eye she saw best with, and great was her astonishment when she found that the painful eye, the eye of which she complained, was the only one with which she could read. Before operation, the sight of the two eyes had been equal.

The right eye presented an iridic adhesion, together with a small cystoid cicatrix. The left eye showed the results of a very regular iridectomy. In the eye where operation had been perfect, sight continued to decline; in the other eye, where there was an entanglement, sight remained good, but the patient suffered.

Similar cases are by no means uncommon. A search of our records has brought to light several other instances. There is, however, no need to labor the point.

A cystoid cicatrix obtained at the price of an entanglement of the iris, then, is unwelcome and dangerous, and one should aim at creating a cicatrix fully as filtering as the cystoid one, without the uveal tract participating in its formation.

It is such a cicatrix that we can obtain by our combined

tridectomy and sclerectomy. It is far from presenting itself always under the same aspect and form. The next section will, therefore, be devoted to a description of the different kinds of cicatrices that may be met with.

III.—The Different Forms of Filtering Cicatrix That May Be Met with After My Operation.

Three chief varieties may be distinguished: (a) thinning of the sclerotic; (b) sub-conjunctival fistulette; and (c) ampulliform elevation of the conjunctiva.

(a) *Thinning of the Sclerotic*.—The sclera is simply thinned when in the course of the operation the scissors remove a part only of the thickness of the fibrous membrane, the slender summit of the scleral *bec de plume*, which the knife cuts in its oblique course from below up and from within out. It is even possible while taking a large shaving from the eyeball that the surgeon may remove only the outer layers of the sclerotic, so that coaptation of the lips of the wound may still occur in the deeper parts of the membrane. The region of Schlemm's canal may thus be deprived of its outer wall, while the internal region remains intact. Under these conditions there can be no free and large communication between the anterior chamber, on the one side, and the subconjunctival spaces on the other. The sole result of the operation will therefore be to enfeeble the scleral envelope at the level of the filtration angle.

This result is by no means negligible, since it is certain that the exit of liquid from the eye is thereby largely facilitated. Figures 1, 2, and 3, have been drawn from patients who have all benefited largely from the operation, and in whom combined tridectomy and sclerectomy have given a permanent success.

Bettremieux (*La Clinique Ophtalmologique*, *nov.*, 1907*) has recently recommended this weakening of the scleral envelope, without opening of the anterior chamber. It is possible that his proposed grooving of the sclera may be useful, although we are of opinion that in order to be permanently efficacious, it should be followed by the opening of the anterior chamber. It is necessary that for several days after the operation the current of aqueous humor should sweep the wound and thus prevent the conjunctiva from adhering to the sclera and rendering nugatory the loss

of substance by organizing at this point into true cicatricial tissue, fibrous and resistant.

In order that the scleral breach may produce a useful result, it is necessary that the liquid of the chambers of the eye should push aside the conjunctiva, raising the latter, edema-like. That result we obtain by our operation. It could also be got by practicing the *ab-externo* resection recommended by Bettremieux and by adding to it a perforation of the globe at a point so circumscribed as not to allow the iris to become entangled and yet large enough to permit the aqueous humor to pass it abundantly.

One would be able thus to obtain a filtering cicatrix without iridectomy in cases of feeble hypertension, as in simple chronic glaucoma, where iridectomy is often redoubtable enough. The feeble hypertension should allow one to avoid the entanglement of the iris in the little orifice made in the scleral envelope, grooved externally and perforated in a circumscribed point. We have made upon rabbits experiments favorable to this method, and the subject is one to which we shall return in a later communication.

Referring to the definitive form of the filtering cicatrix, we may say that this form depends not alone upon the way in which the operation is performed, but also upon the state of the eye.

In simple chronic glaucoma the lips of the scleral wound adhere at every point where there is no loss of substance—the opening does not gape. When the operation is performed upon a case of glaucoma, associated with a notable increase of tension, the wound gapes, even when the sclera has not been resected in its whole extent, and in place of a simple scleral thinning, the surgeon assists at the formation of a subconjunctival fistulette. From another cause, it may happen that the scleral resection is not of the same depth everywhere. Thus, for an extent of several millimetres it may involve only the outer layers of the sclera, while the whole thickness of the sclera may be removed elsewhere. This will result in a cicatrix like that represented by figure 5, in which all the temporal part of the section is merely a thinning of the globe, while a tiny fistulous orifice exists at the inner end of the cicatricial line.

(b) *Subconjunctival Fistula*.—We speak of a “subconjunctival fistula” when beneath the transparent conjunctiva we see a loss of substance in the sclera, an orifice more or less narrow, usually linear, but sometimes rounded. By this orifice the aqueous humor escapes freely into the subconjunctival spaces. It is a fistula in the literal sense of the word. How does this fistula

open into the anterior chamber? To be quite positive on the point, histological examinations must be made, but that has not yet been done. There may be at the point of anastomosis in the angle of the iris a lattice-work analogous to that which exists normally in that region; perhaps the endothelium of the anterior chamber lines the walls of the artificial aperture; perhaps nothing of the sort exists. We know only the external aspect of the scleral opening.

When the scleral aperture is very narrow, it often appears under the guise of a small black point, a coloration due to the total reflection of light which occurs at the spot. It must not be thought that the appearance represents any entanglement of the uveal tract. In order to convince oneself on this point it is merely necessary to examine the eye with good lateral illumination in the dark-room.

Above the subconjunctival fistula, the mucous membrane sometimes retains its regularity and thickness, at other times it is raised, tomentous, and irregularly transparent. When the fistula is covered with fine and regular conjunctiva, it means that the liquid which leaves the eye is not abundant and that it is resorbed by the subconjunctival meshes soon after its escape, and this again probably depends upon the fact that it passes out under feeble pressure. It is obvious that the amount of fluid and the force with which it is pushed under the conjunctiva will vary with such factors as the state of the eye, the kind of glaucoma, and the degree of hypertension.

Broadly, it will be found that a simple chronic glaucoma, with feeble hypertension, will correspond with the second type of filtering cicatrix, namely, the subconjunctival fistulette.

(c) *Ampulliform Elevation of the Conjunctiva*.—This, the third variety of filtering cicatrix, is the most common. It is the invariable product of the combination of two conditions: (1) resection of a piece involving the whole thickness of the sclera, and (2) hypertension of the eye that has been operated on. The first condition places the chambers of the aqueous humor and the peri-choroidal space in free communication with the subconjunctival spaces, and the second ensures that the intra-ocular fluids shall be extruded under considerable pressure.

In this condition there is produced in the thickness of the conjunctiva something analogous to what histologists call *la boule d'adime* and which they obtain by passing into laminated tissue

the contents of a Pravaz syringe. The projection, the volume, and the thickness of the conjunctiva are not always the same even in one and the same subject. When the glaucomatous eye, favorably influenced by the filtering cicatrix, has for a long time been the seat of no recurrences of tension, the conjunctival prominence tends to become effaced. When, on the contrary, under the influence of emotion, grief, or of any vaso-motor trouble whatever, hypersecretion is produced, the eye relieves itself by the filtering cicatrix, so that the conjunctiva becomes more swollen, irregular, and tomentose. This we have seen happen to patients who presented a simple subconjunctival fistulette, sometimes covered with flat and regular conjunctiva, and sometimes with prominent and tomentous conjunctiva—that is to say, a cystoid cicatrix. This third type of filtering cicatrix resembles, in fact, a cystoid cicatrix, but with this important difference, as stated before, *viz.*, that it is a cystoid cicatrix without entanglement of the iris, and consequently free from danger.

We do not believe that to the third type of filtering cicatrix there can be attributed the least drawback from the point of view of the nutrition of the eye, of its protection, and of its functions. Four years have passed since we began to operate upon patients by our procedure, and in truth, we have never seen the least damage result from the operation. Those who prate of infection, of inflammation, or of pain, lack the necessary experience. We say now and here, with the certainty that the future will show that we are right, that all the drawbacks of the old cystoid cicatrices were owing to the fact that they included incarcerated iris, and that the absence of this entanglement explains why the cicatrix resulting from our operation is innocent.

IV.—The Causes Which Lead to Variations in the Appearance of the Cicatrix.

The various types of the filtering cicatrix depend upon the way the operation is practised, and upon the degree of hypertension of the eye that is operated on.

The first form (thinning of the sclera) results from this—that the excision has affected only the point of the scleral beveling, the external layers of the fibrous membrane.

The second type (subconjunctival fistulette) is produced when the whole thickness of the sclera has been excised, and the dimensions of the fistula correspond to the size of the fragment that has been taken away. In order that the altering cicatrix remain

fistulous without becoming cystoid, it is necessary that at the moment of operation the eye shall be little or not at all distended, and that attacks of hypersecretion shall be minimal.

The third type (ampulliform elevation) corresponds to operations in which a large excision has been practised on an eye subject to glaucomatous outbreaks of sufficient intensity to extrude with force intra-ocular fluid under the conjunctiva.

It is important to remark that it is especially the degree of hypertension that decides the form of the cicatrix. When the eye is much distended, the lips of the wound separate even when one contents oneself with sclerotomy, and it is in these cases, and in these cases alone, that de Wecker and his followers managed to obtain permanent filtration. When the eye is less distended, the coaptation of the lips of the wound occurs well, particularly when the surgeon commits the mistake of applying after operation a compressive bandage, which contributes to the closing of the scleral opening. In eyes but little distended, and in those with merely a slight and intermittent hypertension (simple chronic glaucoma) the lips of the wound come into apposition after the sclerotomy. Cases of the last kind are especially those which call for a large sclerectomy. In consequence of the feeble tonus, it may be possible in these cases to dispense with the iridectomy, and to keep the iris in the anterior chamber by the liberal use of physostigmine. This would be a great advantage. At this moment we are engaged in studying the means of improving our plan in this direction in the treatment of glaucoma.

As regards the extent of the scleral resection, we may formulate the following proposition: the extent of the sclerectomy should be in inverse ratio to the hypertension of the operated eye. Thus, in an eye with tension $+3$, the wound gapes enough for a filtering cicatrix to be established by simple sclerotomy. If tension be $+2$, one may content oneself with a small sclerectomy. For an eye with tension $+1$, and still more so when the tension is normal, a large, a very large, sclerectomy must be made.

We have now finished with the different kinds of filtering cicatrix that may be obtained in the treatment of glaucoma, it being understood that every surgeon executes our operation in accordance with the rules laid down in our former communications. We shall not discuss in this place the question of clinical results, for our views upon this matter are well known. We can only regret that sclerecto-iridectomy has not yet been performed by a

large number of surgeons, because we are convinced that their results will be similar to our own. We do not purpose to set out the results here, but we shall return to that point presently. We purposely allow our cases to accumulate and to become older, so that we may eventually present an imposing collection of figures.

To those who have been good enough to read this communication I will say, in conclusion, that sclerecto-iridectomy yields a filtering cicatrix making a communication between the chamber of the eye and the perichoroidal space and the subconjunctival cellular tissue: that this filtering cicatrix is capable of doing away with the hypertension of a glaucomatous eye: and finally, that a glaucomatous eye freed from hypertension is cured, in so far as surgery can cure it.

SYDNEY STEPHENSON.

THE VALUE OF MORPHINE DERIVATIVES IN OCULAR THERAPEUTICS.*

BY L. WEBSTER FOX, A. M., M. D., PHILADELPHIA.

Some of the newer salts of morphine, but whose efficiency or improvement over the older and more stable preparations has not been proven, are anisate, benzoate, borate, phthalate and tartrate, saccharinated, stearate, heroin—an acetic ester of morphine—and ethyl-morphine hydrochlorate (dionin). This latter derivative is the only one which has proven of value in ophthalmic practice.

Dionin has proved to be a valuable drug in ophthalmic practice. From the time that Dr. Wölflberg of Breslau drew the attention of the profession to its use in the treatment of eye diseases, many other investigators have tested it in a large number and several kinds of cases. Barier of Paris was enthusiastic as to its value, and many articles upon its use by other ophthalmic surgeons have been published.

Ethyl-morphine hydrochlorate (generally known as dionin) is a derivative of morphine, having the chemical formula $C_{15}H_{23}NO_3 \cdot HCl - H_{20}$. It is supplied as a white, odorless, bitter powder, soluble in about seven parts of water. It is an advantage that its aqueous solution keeps unchanged for a considerable time. In ophthalmic practice it has been used in the powder form, in aqueous solutions of from 1 to 10 per cent as an ointment, or in rods of cocoa butter of the same strength.

*A paper read at the Ninth Annual Meeting of The American Therapeutic Society, Philadelphia, May 8, 1908.

When applied to the eye, dionin produces a smarting sensation, and even a slight pain at first, followed by sneezing in many cases. There is more or less vascular injection and chemosis of the conjunctiva, with an increased flow of tears. Dionin has no effect on the pupil, the accommodation, or intra-ocular pressure. In one patient, however, I noticed that after needling for soft cataract and making an application of dionin, the pupil became contracted, although full atropine mydriasis existed before its application. The pupil again dilated after the chemosis of the conjunctiva disappeared.

When the drug is used for the first time, in 5 per cent or 10 per cent solution, the rapidly induced chemosis is most alarming to witness, but a study of its action has shown that it is only produced by the stronger solutions. With the weaker (1 to 2 per cent) there is no chemosis and but little smarting is produced. Dionin is an analgesic and its action sets in within a few minutes after it is applied to the eye, but it is not an anesthetic, the sensibility of the cornea remaining unchanged by its use. In this it differs from cocaine and holocain, both of which are anesthetics, as well as analgesic in effect.

Many ophthalmologists in France, Germany, Russia, and the United States have experimented with dionin since Darier so persistently forced its claim upon the notice of the profession, and it has been tested in a great variety of cases, such as acute conjunctivitis, trachoma, blepharitis, pannus, parenchymatous and phlyctenular keratitis, ulceration of the cornea, corneal opacities, iritis, vitreous opacities, retinal detachment, choroiditis, glaucoma, and secondary cataract.

The majority of writers agree in stating that dionin has a distinct influence in relieving pain, especially when connected with corneal or uveal affections. It also shows a marked influence in clearing corneal opacities, which action is attributed to its lymphagogic effect, and it has been claimed that it is distinctly useful in iritis and retinal detachment.

Reports of its action in the hands of different investigators have somewhat varied, and it may not be uninteresting to furnish yet another report of the results from its use as observed in the Ophthalmic Department of the Medico-Chirurgical Hospital in Philadelphia and also in my private practice.

The value of this drug lies in the mode of its application. My experience, in many cases, proves that the sub-conjunctival

injections give better and quicker results than the topical application, especially in those acute forms of interstitial keratitis which have resisted all forms of mercurial medication. In many varieties of this, at times, intractable disease, after three sub-conjunctival injections of a 2 per cent solution I have frequently found the cornea rapidly become clearer, and then, with the addition of mercurial inunctions get perfectly well. My assistant, Dr. Brophy, has applied this derivative of morphine in the shape of an ointment to a great variety of chronic corneal opacities, and opacities following granular lids. If any clarification of the opacities occurred it came very slowly. In fact, we have come to the conclusion that this method of treatment of long standing opacities has little, if any, therapeutic value.

In the treatment of acute ulcerations dionin has much value, especially in the marginal ulcers of old people. I can record case after case of this form of ulcer, and several dendritic ulcers in which other forms of treatment seemed to fail and prompt healthy reaction and complete recovery were established by the dionin treatment.

In retinal detachment I have, as yet, failed to see any benefit from this drug alone, whether applied locally or by sub-conjunctival injection. My practice, in these cases, is to make a sclerotic incision and drain off the sub-retinal fluid. I keep the patient in bed for six or seven days, resting quietly, then make a sub-conjunctival injection of dionin to assist in clarifying the cloudy vitreous. By this surgical and therapeutic combination I have had surprising results in 20 per cent of my cases. When one recalls the former methods of treatment and the disappointing results, this is, to say the least, encouraging.

My experience leads me to believe that for vitreous opacities from any inflammatory cause a combination of sodium saccharate and dionin gives better results than either of these drugs afford when used alone. I make these sub-conjunctival injections three times weekly, the quantity being from ten to twenty minims.

After giving this derivative a thorough trial in many ocular diseases, in none is its action more strikingly shown than in painful iritis. By the use of the 5 per cent solution pain will cease within two hours, and more rapid relief will be obtained by sub-conjunctival injections than when that drug is applied to the eyeball.

My experience has not led me to advise the use of dionin in acute glaucoma. In several of such cases it neither afforded relief

from pain, nor a lessening of the tension, and an operation became the only resource.

In the short time allowed for a paper of this character no one can do full justice to his subject, I shall, therefore, have to present a brief summary of my experience which has extended over several years.

1. Ethyl-morphine hydrochlorate may be used in a solution of from 1 to 10 per cent, or in an ointment or powder form. It is an analgesic and not a local anesthetic.

2. It is most valuable when combined with atropine in painful acute iritis and irido-cyclitis, and it assists in breaking synechiæ and relieving pain.

3. It is of some value in recent corneal opacities, but its value is doubtful in old opacities.

4. It is of some benefit in recent vitreous opacities, but its use is doubtful in chronic hyalitis.

5. It is doubtful whether it is of use in detachment of the retina.

6. I have made repeated applications in secondary capsular cataracts, but have noticed no exceptionally rapid clarification of the pupillary space.

7. It affords no special aid in the absorption of the lens matter in a soft cataract after needling.

8. It is not necessary, as a rule, to confine the patient in bed during the treatment.

9. The reaction is violent after the first three injections, but it subsides in about an hour's time.

This is my summary of the use of dionin in ophthalmic practice. In regard to the results experienced in the use of the other derivatives of morphine I am not yet ready to report.

GLIOMA OF THE RETINA, EXTIRPATION AND RECOVERY.

By Dr. G. J. SCHNEIDER, ELGIN, ILL.

March 3, 1902, I was consulted by Mrs. Edna Gibson in regard to her daughter's eyes. The age of the child was two years and two months. The history of the case is as follows:

The father and mother are in perfect health. The only hereditary disease is consumption; the mother's father and two aunts having died of the disease.

The mother had noticed that the child was unable to see

with her left eye for about three months. Her attention had been attracted to it on account of the red or yellow reflex of the pupil. The patient complained of no pain, but upon examination I found that the child was totally blind in the left eye, tension increased and slight congestion of the vessels of the sclera and the pupil dilated.

Upon examination in the dark room I found general detachment of the retina and the blood vessels running over a yellowish white tumor. The entire retina seemed to be detached. From a clinical examination a diagnosis of glioma that was confined to the eyeball was made. The mother was advised to have the eyeball enucleated and in order to verify the diagnosis and treatment, further consultation was recommended. This advice was accepted. The diagnosis of glioma was verified and on March 5 the eyeball was enucleated. The patient made a good recovery.

December 15, 1907, six years later, a letter from the mother states that the child is still living, her health, according to children of her age, is good. She has had only one case of sickness, viz., measles, since the eye was removed. The child is now going to school and is able to keep up with her class. The right eye is normal, with perfect vision. There is a slight discharge from the orbit of the left eye, but aside from this she seems to suffer no pain or inconvenience. The mother also stated that she is about as well developed as any child eight years of age. The reason for reporting this case is, that parents usually refuse to have their child's eye removed where no positive assurance can be given as to the prognosis.

OPERATION FOR REMOVAL OF STYLE IN THE NASAL DUCT.

Operation for Removal of Style in the Nasal Duct.

Mr. W. came to my office from Virginia for treatment of dacryocystitis of right eye.

I opened the canaliculus and inserted a silver lachrymal style (see cut), being one inch long, one-sixteenth inch in diameter, one-eighth inch head, and one-eighth inch curve at neck. I then gave him a prescription for some eye-drops, and sent him to his home.

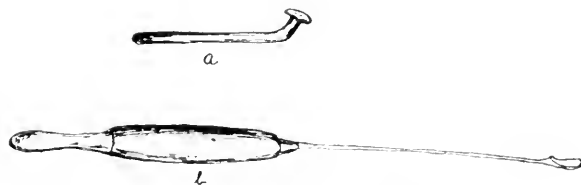
The patient returned in about five weeks and upon exami-

nation I found that he had pushed the style into the nasal duct and it would require an operation to remove it. I had him go to the Episcopal Eye and Ear Hospital, where under anæsthetic I made an incision to remove the lachrymal sac, but I could not get any instrument to remove the style.

One of the physicians present at the operation said he could get the style out through the nose. I allowed him to try for about ten minutes, and at the expiration of that time the patient's condition would not permit further attempts to remove the style, here having been no success so far. In a few days the patient left the hospital.

Upon his return to my office in about six weeks he complained of pain in his right jaw at times, and after opening his mouth he could not close it for several minutes. I made an examination under the inferior turbinate bone with a probe, and immediately upon touching the style he had great pain in the right jaw and the jaw became as firmly set for about seven minutes as though he had lock-jaw.

I had him return to the hospital. In the meanwhile I made an instrument (see cut) which is about eight inches long, the



a. Lachrymal canula. Actual size.
b. Instrument for its removal. Reduced one-fourth.

smaller end being spoon-shaped about one-sixteenth wide, the bowl about one-sixteenth inch deep, the handle was about one-quarter inch to insure firm grasp, and this tapered gradually to the bowl.

After ether was administered I made a long incision over the sac. I then placed the spoon-shaped instrument on the end of the style under the turbinate bone, and while Dr. W. Norwood Souter held it in place I separated the tissues over the sac, and with slight pressure the style came up and I removed it with a pair of forceps. The patient made a complete recovery.

S. B. MUNCASTER,
Washington, D. C.

TWO ANOMALOUS WINKING CASES.

J. N. RHOADS, M. D.

PHILADELPHIA.

Within the last six months I have noticed two peculiar winking cases. Every time the patient winked, the alae nasi dilated. The compressor nasi muscle while contracting, would throb or swell, as much as I ever saw a radial artery do on a thin person. No other muscle of the nose or face seemed to be the slightest bit stimulated or affected. Closing one eye and winking the other, the contraction was not as marked. It was scarcely perceptible on the side of the closed eye.

Neither patient was aware of this anomaly, because, of course, while their eyes were closed in the act of winking, they could not see the phenomenon. I was able to demonstrate to one of the patients, by the use of his finger that the throbbing occurred, but the other being much older could not himself detect it. Esthetically, one man was slightly marred, as the dilatation was noticeable. If, however, anyone had noticed the peculiarity the fact was never made known to him.

I wish to report these cases simply as anomalies, not knowing that they have any pathological significance. When we remember that the depressor nasi are connected with the orbicularis oculi, it is not so remarkable that this phenomenon should occur.

Review.

[The following is a resume of Dr. Beard's paper which, owing to an incorrect stenographic report, was not properly abstracted in the report of the Chicago Ophthalmological Society, in the April RECORD.—Ed.]

External Ocular Tuberculosis.

External ocular tuberculosis is a disease of rare occurrence which may affect the lids, the cornea or the conjunctiva, or still more rarely the other appendages of the eye, and is peculiar to childhood and adolescence.

Among the diagnostic signs are preauricular or submaxillary adenopathy, which is present in about 80 per cent of the cases. This may be slight and fugitive, or severe and suppurative. The pus of a gland infected by Parinaud's conjunctivitis, for instance,

contains no microbes, and will not infect guinea pigs, while that from tuberculosis is always infectious for this animal.

Tuberculosis of the lids is rarely primitive, being most often secondary to lupus or other tubercular lesion of the neighboring parts. The varieties are:

I.

1. Ulcerations.
2. Granulations.
3. Vegetations.
4. Gummata and cold abscesses.

II.

Lupus.

The latter we will not consider.

Diagnosis.—One must exclude hot abscesses, chalazion, chancre and actinomycosis.

Tuberculosis of the Cornea.

It has been supposed that nonvascular tissue could not be the seat of a primary tubercular infection, but numerous recent observations tend to refute this idea; though it has not been proven that the parenchyma of the cornea can be attacked by the Koch bacillus independently of the surrounding region, *i. e.*, of the iris and ciliary body. Tubercular keratitis is usually interstitial, and accompanies tuberculosis of the uveal tract. The other form is ulcerative, and is secondary to tuberculosis of the lids and conjunctiva.

Tuberculosis of the Conjunctiva.

This form is said to be primary in about 60 per cent of cases. The infection is endogenous in about 25 per cent. The palpebral conjunctiva is the seat of the lesion in about 50 per cent. It is, as a rule, monolateral. Bilaterality warrants strong presumption of contagious conjunctivitis, and the microscope often affords a means of clearing up the doubt. The diagnosis is *clinical* and *experimental*. The most frequent clinical forms are the miliary and the ulcerative. The chief clinical features are little or no pain, copious mucous or muco-purulent discharge, nodules or ulcerations—or both—purplish swelling of the lids, and preauricular and sub-maxillary adenopathy. Tuberculosis of the conjunctiva is to be differentiated from: 1, blepharitis; 2, trachoma; 3, epithelioma; 4, chancre; 5, gumma; 6, leprosy; 7, Parinaud's conjunctivitis (of animal origin); 8, granuloma; 9, lymphoma; 10, pseudo-tuberculosis, from the hairs of the caterpillar, and 11, lupus.

Experimental diagnosis consists of:

1. Histologic examination of tissue.
2. Search for the Koch bacillus.
3. The subcutaneous injection of tuberculin
4. The sero-reaction.
5. The ophthalmic-reaction.
6. The inoculation of animals.

External ocular tuberculosis is peculiar in that it affords means for resorting to the first, second and sixth methods here enumerated.

If histologic examination demonstrates the typical giant cells in the tissue, or if the Koch bacillus can be found all doubt is removed as to nature of the lesion; but the failure to discover them does not prove their absence. Hence these tests are valuable only if they are positive.

The subcutaneous injection of tuberculin is not reliable because tuberculosis in other parts of the body cannot be excluded.

The sero-reaction has not been sufficiently tried to warrant the assumption that it is an absolute sure diagnostic means. The process is based on the agglutination of certain cultures of the Koch bacillus caused by the serum of a tuberculous subject.

The ophthalmic-reaction will be treated in extenso at this meeting.

The inoculation of animals with fragments of the suspected tissue, as first practiced by Parinaud, in 1884, constitutes the only practically infallible means, at our disposition for the experimental diagnosis of external tuberculosis of the eye. The guinea pig is usually chosen for this purpose as it is more susceptible than the other animal. A bit of the suspected tissue is excised and inserted, with rigorous asepsis, beneath the skin of the animal's abdomen and the incision closed by a suture. An inguinal adenopathy is now to be watched for. This shows itself in from three weeks to one month. The affected gland is extirpated, and the caseous pus contained therein, after coloration by the Ziehl-Neelson process, is examined, microscopically, for the tubercle bacillus. This found all doubts as to the nature of the material introduced are set at rest.

Reports of Societies

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of April 15, 1908, at the Illinois Charitable Eye and Ear Infirmary.

DR. T. A. WOODRUFF, Presiding.

A Case of Cicatricial Ectropion and Ptosis Relieved by Operation.

Dr. Charles H. Beard exhibited a girl, 20 years old, who had, since childhood, had exaggerated ectropion of the right lower lid from some form of ulceration of the skin beneath the eye that, judging from the scar, seems to have been a blastomycosis. There had been a previous attempt to correct the deformity. About one year ago she was admitted to the Infirmary and submitted to a plastic operation which has resulted in perfect replacement of the lid. The operation consisted in making an incision parallel with and about 3 mm. from the free border of the lid, and extending beyond the canthi, dissecting beneath, and loosening freely the everted lid, so that it could be turned up over the upper lid, with the cilia in contact with the super-cilia. This left a very large elliptical defect, to cover which Dr. Beard took from the inner side of the upper arm an enormous Wolff graft, measuring 4 by 3 inches. The arm defect was so expansive that notwithstanding extensive undermining of the surrounding skin, and the making of bracket incisions, the wound could be only partially closed, so that Tiersch grafts were put on, after granulation had occurred. The Wolff graft was lightly stitched to the skin around, the upper thread ends being left long, and fastened to the brow by collodionized gauze. The patient was discharged with perfect replacement, early in the summer of last year.

She returned to the hospital this past winter with an epiphora of the same eye that was remarkable for its copiousness, and, in consequence, a slight mucous ectropion of the lower lid. To relieve the condition the orbital lachrymal gland was removed. This proved to be of unusual size. The palpebral portion of the gland was spared. The mucous ectropion promptly disappeared. Notwithstanding the fact that the branch of the third nerve supplying the levator is, normally, far removed from what was the field of operation in this instance, there followed complete ptosis, which remained so long without any signs of improvement that a ptosis operation was decided upon. Dr. Beard can account for injury to the third

nerve only by supposing an anomalous distribution of the levator branch. The Motais measure was chosen. It is now about one month since the operation was made, and the result is most satisfactory. The lid is not only sufficiently elevated, but goes up further with upward movements of the globe.

A Case of Argyrosis.

Dr. Willis O. Nance exhibited a case of decided argyrosis in a woman of 40. The bulbar conjunctivæ of both eyes were stained a dirty black, so that no white sclera could be seen through the normal palpebral fissures. The conjunctival surface from the inner canoescleral aspect to the inner canthi, including both caruncles, were stained a jet black. The palpebral conjunctivæ were also deeply stained. The history of the case is obscure. The patient is a Russian Jewess, who six years ago suffered an attack of smallpox in her native land. The eyes were affected and a physician gave her some drops to use. She dropped the medicine (undoubtedly a solution of nitrate of silver) in her eyes three time a day for more than four weeks. She has a typical cicatricial trachoma. Six months ago she came under the care of Dr. Lebensohn, who states that the stains have decreased nearly one-fourth in intensity since she came under his observation. He has been employing dionin.

Mules' Operation.

Dr. Nance also exhibited a boy of 13 upon whom an evisceration of the right eye had been done ten days ago, and a glass-ball inserted in Tenon's capsule according to the method of Mr. Mules. The boy, while playing in the street, had run against a spike in a telephone-pole, sustaining a wide and deep perforating wound of the eyeball. A rather marked reaction had followed the operation, with considerable swelling of the side of the face, but practically all had now subsided, the wound appeared smooth, with every indication of the glass ball remaining. The operation was performed by Dr. Swift, the house surgeon in Dr. Nance's service at the infirmary. Dr. Nance also reported a case of successful Mules' implantation which he had done nine months ago. He believes that in cases where the ball works out of the socket, in most instances, the ball implanted is too large.

Ophthalmia Neonatorum Treated by Copious Irrigations.

Dr. Nance reports favorable results in the treatment of purulent conjunctivitis of gonococcic origin of the new-born in a series

of four cases at the infirmary under his own service and that of Dr. E. V. L. Brown. The method employed was that of Kalt, which consists of irrigating the conjunctival sacs three times a day with two litres of a 1:15,000 solution of permanganate of potash. A fountain syringe and a specially prepared glass tip, made absolutely smooth, are used. The container of the syringe is placed not more than two feet above the patient's head. The infant is held on its back during the irrigation. No other treatment was employed in the cases reported.

A Case of Gonorrheal Conjunctivitis and Specific Vaginitis in a Girl of Nine Years.

Dr. Nance exhibited a little girl who was sent to the infirmary from a public institution for children three weeks ago. She suffered from a virulent purulent conjunctivitis with extensive corneal involvement. The presence of gonococci was demonstrated both in the eye and the vagina. The conjunctival disease cleared up under frequent boric irrigations and the use of strong argentine nitrat applications. The cornea presents a circumscribed opacity involving the lower third.

Hemorrhage Into Anterior Chamber Following Cataract Extraction.

Dr. W. H. Wilder reported a case of hemorrhage in the anterior chamber four days after cataract extraction. The anterior chamber was almost filled with blood; there were repeated hemorrhages. The urine and blood pressure tests were negative. The hemorrhage gradually cleared up.

Hyaline Degeneration of Conjunctiva.

Dr. Wilder also reported one case shown before the Society at a former meeting. The entire conjunctival sac was atrophied.

Symblepharon.

Dr. Wilder exhibited a boy on whom he had operated for symblepharon by the aid of a Thiersch graft on a metal plate.

Leucomata from Corneal Ulcers.

Dr. Wilder presented a man who had suffered from serpiginous ulcers of both cornea. He called attention to the efficiency of cauterization and paracentesis of the anterior chamber in the treatment of ulcers of the cornea.

Keratitis Disciformis.

Dr. E. V. L. Brown showed two cases of keratitis disciformis.

one in a man who had had a small corneal ulcer caused by the Morax-Axenfeld diplobacillus, and the other in a boy with the stigmata of inherited syphilis, but no local cause; extensive posterior synechia was present in the boy.

Both cases showed or had shown the typical central infiltrate with sharply demarcated outer borders and two or three complete or incomplete concentric rings or arcs of infiltrate, along with deep radial bands of opacity.

The only complete anatomical study of a case of this interesting form of interstitial keratitis has been made by Meller, who found an anterior and a posterior deep infiltration ring complicated by an anterior uveitis, which he believes to be only an attendant finding.

Interstitial Keratitis.

Dr. H. B. Young presented a case of interstitial keratitis as a possible illustration of the traumatic factor in the etiology. The patient was a man of 30 years, who six weeks ago had an abrasion of the cornea from a small foreign body which he said was removed by a fellow-workman on the day he got it. Two days later when he presented himself for treatment a small depression could still be seen. He has had no rheumatism, etc., but the teeth are suggestive of inherited disease.

MORTIMER FRANK, Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of April 18, 1908, in Denver.

Dr. MELVILLE BLACK, Presiding.

Pemphigus.

Dr. W. C. Bane re-exhibited the case of pemphigus shown by him at the January and February meetings. He had recently excised the infiltrated tissue, which nearly obliterated the lower conjunctival sac, and brought a flap of conjunctiva from above and lined the sac with it. The tissue removed was examined pathologically by Dr. J. C. Todd, who reported it to be cicatricial granulation tissue, with no evidence of epithelioma.

DISCUSSION: Dr. Neepor would use X-rays or preferably the high frequency current, and would note whether the pemphigus affected the transplanted conjunctiva.

Dr. Black would try thio-innamin, internally, on account of its action on cicatricial tissue.

Dr. Sisson stated that thio-innamin, by absorbing fibrous tis-

sue, was deleterious in fibroid tuberculosis. He called attention to reported changes in the retina and other tissues from use of the X-rays.

Dr. Jackson related a case in which X-rays had been used up to three times a week for six years, associated with several excisions, for carcinoma near the inner canthus, with no damage to sight. Lately the cancer had invaded the orbit, displacing the eye, injuring the optic nerve, and reducing vision. He thought the X-rays did not usually injure the eye.

Double Monocular Diplopia.

Dr. E. W. Stevens presented a man, aged 50 years. R. V. 1-12, the same line being seen less distinctly above and a little to the left. L. V. 1-12, another line being seen as with the right eye, but below and to the right. With both eyes two lines of letters of equal distinctness, one exactly above the other, were seen.

The patient had first noticed this disturbance of vision two years before. The ophthalmoscope showed nuclear haze of each lens, but no fundus lesions.

Dr. Stevens ascribed the diplopia to the beginning lens opacity. Dr. Friedmann had seen one case of monocular diplopia, associated with an iritic adhesion above, and another synechia below.

Drs. Coover and Libby called attention to cortical opacities in the temporal periphery of each lens.

Dr. Jackson mentioned Freytag's report of 36 cases of double focus lenses. He spoke of the increase of refraction in the clear lens preliminary to the development of cataract; and also recalled C. Hess' cases of this kind in which the lenses did not become opaque for some years.

Chronic Uveitis.

A male aged 30 years, under observation for the previous two weeks, was also shown by Dr. Stevens. Sight began to fail three years before. The pupils had been kept dilated with atropin for over two years. He had received little constitutional treatment. Vision 1-30 in each eye.

The eyes were now quiet. There was no pericorneal zone of redness. There were several tags of iritic adhesion, and the vitreous was very hazy. He was being treated by mercurial inunctions and potassium iodide, with pilocarpin sweatings.

High Myopia, Detachment of the Retina and Extensive Choroiditis in the Left Eye, the Right Eye Having no Light Perception.

Dr. Stevens also presented a male, aged 34 years, who had come under observation one month previous.

Fifteen years before he had first put on glasses for poor distant vision. For the past two years he had worn — 9, sph. in each eye.

Five years before he had first noticed that the right was blind; having noticed no pain or inflammation. About two months before he had first noticed a large floating body in his seeing eye, which now blotted out the lower temporal field. The right pupil was occupied by opaque lens, and there was no light perception. The left vision, with — 20.00 D. S. = 4/20.

Ophthalmoscopic examination showed extensive choroiditis in the left eye, with detachment of the retina to the nasal side of the disk.

DISCUSSION: Dr. Chase would give pilocarpin sweats for the retinal detachment. Dr. Sedwick suggested the use of a pin-hole disk to improve central vision.

Infantile Cataract.

This baby was seen by Dr. Melville Black when she was seven months old, in February 1907. The mother was sure that vision had been good until two months previous. No congenital cataract in the family history.

The child was well nourished, with fully developed eyes. Both lenses opaque; pupils 2 mm. wide, and reacted normally to light.

Under atropin pupils only 4 mm. wide. A needling was performed on each lens, but it was found very difficult to penetrate the capsules as they were tough and receded before the knife-needle. It was observed when endeavoring to get the knife through the capsule, that the central area was very opaque and that the lens, as pushed by the needle, exposed a peripheral area which was less opaque.

No reaction whatever followed the operation, nor did it cause any apparent absorption of the cataract. Two months later no apparent change in the eyes was manifest, although another needling had been attempted meanwhile. Dr. Black then opened the cornea at its upper margin with a keratome and performed a small iridectomy. While attempting to grasp the opaque capsule with forceps vitreous presented.

He went on and removed the opaque capsule. No lens matter

was present. No special reaction followed. The child was not seen for five months; when the eye was seen to have a very small pupil at the upper corneal margin, the iris being drawn as a curtain towards it. The iritic curtain was now split for passing a No. 2 Knapp's knife-needle through the lower sclero-corneal junction up to the pupil and cutting downward. When shown before the society, six months after this operation, the child had a good central pupillary area which was free from all membrane. It was also plainly evident that the baby had vision. The question with Dr. Black was, should he do any thing more to the other eye, which presented a similar dense membrane, the extraction of which would doubtless be attended with loss of vitreous.

He thought there would undoubtedly be amblyopia from non-use and that divergent squint would develop, if the membrane was not soon removed; which possibilities could be avoided by its removal. In his opinion it was best to either operate now under general anesthesia or else wait until the child was old enough to have it done under local anesthesia.

DISCUSSION: Dr. Chase would not fear amblyopia before five years, when he would operate under local anesthesia. He had operated on a boy of five years, seven times under local anesthesia.

Drs. Hilliard and Neepor would operate now; the former believing that amblyopia would develop in a few years in the unoperated eye.

Dr. Jackson would not fear amblyopia, but would operate soon so as not to lose the opportunity of developing the fusion sense.

Ulcerative Keratitis from Foreign Body.

Dr. Black saw this man on March 31, after he had suffered three weeks with a corneal ulcer occasioned by a neglected foreign body.

Almost the entire left cornea was in a state of ulceration, and was destroyed down to Descemet's membrane. The extensive ulcer was forcibly syringed until clean, with 1-5000 bichloride, and 20 minims of 1-5000 cyanide of mercury was given subconjunctivally. The patient was given a solution containing 25 per cent argyrol and $\frac{1}{2}$ per cent atropin to drop in the eye every two hours. The ulcerative process was arrested at once.

Two injections subconjunctivally of the cyanide of mercury were given later, and the argyrol and atropin were continued. Repair and clearing of the cornea had begun and relief of pain resulted after three days' use of diionin. The ulcer was now

almost healed and it was evident that some useful cornea would result, without staphyloma.

DISCUSSION: Dr. Strader believed nitric acid applied to corneal ulcer was more effective than subconjunctival injection of cyanide of mercury.

Dendritic Keratitis.

Dr. Black first saw this man a week before. He gave a history of acute catarrhal conjunctivitis of five days' standing, which process was unattended by pain or photophobia until the day before examination.

Dr. Black found much lachrymation and intense photophobia. On the temporal corneal quadrant was a branching ulcer which resembled the twig of a tree or tendrils of moss. Zinc solution was ordered to be used every two hours. The next day the branching was more extensive, one tendril reaching the center of the cornea. The different ramifications of the ulcer were touched with pure carbolic acid, a subconjunctival injection of cyanide of mercury was given, and 25 per cent solution of argyrol with atropin was prescribed for use in the eye every two hours.

The ulcer was now almost healed and took scarcely any stain.

DISCUSSION: Dr. Neepser had found applications of argyrol to the palpebral conjunctiva of the upper lid, of greatest help in treating a dendritic corneal ulcer.

Dionin in Interstitial Keratitis.

A woman, aged 58, was first seen by Dr. Black two years previous, when she gave a history of ulceration of the left cornea 15 years before, which got well after a year. Her baby then scratched her right eye, and she suffered the same way with it for about the same length of time. She wanted to know if anything could be done to improve her vision, which was R. E. 20/200; with plus 3.50 axis 90°=20/50. L. E. 3/200, not improved. Both corneas were covered with nebular opacities. The right pupil dilated in a vertical oval and the left dilated uniformly. The right pupillary area showed, with the ophthalmoscope, horizontal striae which looked purely capsular, a few deeper opacities also being seen. No vitreous or fundus changes were seen in the right eye, but the vitreous of the left eye contained a large fixed opacity on the nasal side. She was given 3 gr. thiosinnamin twice daily for two months; when it was discontinued because her vision had not improved.

Four months later Dr. Black found the vision of the right eye reduced to 20/10, with her glasses. She was now given a 5

per cent dionin salve, which she used for several months without improvements.

On April 11, 1908, she again stated that her right eye had been inflamed and painful for three months and that she had slept but little on account of pain for three nights. Very marked interstitial corneal changes were noticed, especially over the lower half, with superficial pebbling, which stained very slight. Under atropin the pupil was found to dilate irregularly because of posterior synechiae.

The only treatment prescribed was 5 per cent dionin salve. The results were striking.

The cornea largely regained its luster, was no longer roughened and the interstitial changes were clearing. The pupil was irregular and contained some exudate.

Jequirity for Trachomatous Pannus.

Dr. Black presented a patient to show the effect of jequirity at its height. The powdered bean was dusted into the eye thirty hours before for pannus from trachoma involving one eye only. The palpebral conjunctiva had been studded with hard papillary granules, which were individually opened and expressed or excised. The boric acid powder massage treatment had been used for two months and a solution of sulphate of copper made from a 10 per cent glycerole of copper (Prince) had been used at home. The conjunctiva was now quite smooth, with few cicatricial changes, but the pannus was quite dense. Jequirity has given Dr. Black good results in such cases.

Trachomatous Keratitis.

A woman, aged 55 years, had been under Dr. Black's care for two months. She had gone through all the ravages of trachoma and was in the cicatricial non-inflammatory stage. Dr. John Green had operated upon her left eye some years before for entropion. She still had a few lashes, which she prevented from turning in by pulling them out. She wore an artificial eye over an old atrophied stump on the right side. Shortly before Dr. Black saw her the vision of the left eye became poorer than usual from a "scum coming over it." The left cornea was filled with nebulous opacities, both superficial and deep, discrete and confluent.

No inflammatory symptoms and no pain, but the eye ball was slightly injected. A few drops of methylene blue caused a staining of the cornea in the form of fine lines running in a vertical direction. This was probably due to scratches on the cornea from incurved lashes.

The pupils dilated under the use of homatropin. Five per cent dionin salve was used at bed time, with possibly some improvement. The globe was no longer congested, but the vision was fingers at 4 feet, as when first examined. Dr. Black desired suggestions as to further treatment.

DISCUSSION: Dr. Bane would use 4 or 5 per cent mercurial ointment daily, in the roughened cornea and cicatricial changes of old trachoma.

Dr. Coover had found 1 or 2 per cent ichthyol ointment efficacious in lid hypertrophy.

Dr. Neepor had not found dionin so useful as some other remedies in treating corneal opacities.

Dr. Chase had seen hypopyon keratitis, with one-fifth of the anterior chamber filled with pus, clear in a few days under the use of 20 per cent argyrol instillations.

Secretary's Report for the Year Ending April 18, 1908.

There are now twenty-five active members, four having been added during the past year. Leadville, Boulder, Greeley and Cheyenne are represented by one member each, Colorado Springs by six, and Denver by fifteen members.

PROCEEDINGS OF THE OPHTHALMIC SECTION OF THE ST. LOUIS MEDICAL SOCIETY.

Meeting of March 11, 1908.

Dr. J. F. Shoemaker presented a case of negroid choroid in the right eye of an American child, the left eye being the normal eye of a person of light complexion. The iris of the right eye was also much darker than that of the left eye and there were numerous dark colored spots in the sclera.

DISCUSSION: Dr. John Green, Jr., thought that this might indicate some remnant of negro blood of remote ancestry. It would be very interesting to have the patient examined with that point in view.

A Case of Siderosis of the Right Eye, Caused by a Piece of Iron-scale Which the X-ray Failed to Locate (Presentation of Patient).

BY HENRY MEUTZE, M. D.

In the morning of September 24, 1904, the patient, a cabinet-maker, now 49 years old, while cutting off a bolt, was struck in the right eye by a piece of iron-scale. He kept on working and when he presented himself in the afternoon for treatment, the condition

of the right eye was as follows: Shallow cut in outer part of margin of lower lid; a small perforating wound in inferior exterior quadrant of cornea; irido-dialysis, and upon dilatation of the pupil, a small dark opacity in outer lower quadrant of lens was observed. Other media clear, fundus normal vision 20/20. Patient had no conception of size of piece of iron-scale which struck him and two X-ray examinations proved negative. It was then assumed that a larger piece had struck the eyeball and dropped off, and that what at first appeared to be a foreign body in the lens was nothing more than partial traumatic cataract. After appropriate treatment, patient was discharged three weeks after the injury with normal vision. About four months later, he presented himself again, for reading glasses, and the condition of the right eye was the same. About a year after the injury the entire lens had become cataractous and the iris, naturally gray, had assumed a brown color; it was rust-stained. From now until October 19, 1907, when successful extraction with iridectomy was performed, the patient had several attacks of irido-cyclitis, which were easily controlled by the usual remedies. The heavily rust-stained lens was examined carefully, but no foreign body was found. It was undoubtedly absorbed and deposited again as hydroxide, causing the uveitis from which the eye is still suffering at present. The eye is perfectly quiet; vision is still improving, and with plus 11.00 D. S. is 1/10. The failure of the X-ray to reveal the piece of iron-scale is explained by the fact that in its shortest diameter, it must have been too thin to offer sufficient resistance to the ray and the picture through the longer diameter was easily obliterated by diffusion of ray from the cranial bones. In a similar case, the giant magnet would be called to aid, besides the X-ray.

DISCUSSION: Dr. M. H. Post asked if the doctor had tried the sideroscope. They had had excellent results from the use of it under the management of Dr. Ewing.

Dr. Meutze said he had not. The experience of this case had taught him not to depend entirely upon the X-ray. Iron-scales offered very little resistance to the X-ray and in this case the piece must have been very small indeed. There were numerous large and small opacities in the vitreous. The iris now looked rusty and brown and the oxid had set up a uveitis with all its consequences.

Dr. Jennings suggested that since the picture had been taken, four years ago, a great improvement has been made in the technique of radiography and perhaps now a similar case would be shown in the plate.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Professor Everbusch of Munich has recently received the title of Geheimrat-Hofrat.

Dr. Bonvin, for many years associated with Snellen, died recently at The Hague, Holland.

Dr. Alois Schapring, well known as an ophthalmic surgeon in New York, died recently, aged 60 years.

The Fifth Pan-American Medical Congress meets this year at Guatemala City, Guatemala, August 5 to 10.

Dr. L. Webster Fox of Philadelphia has received the degree of LL. D. from Dickinson College, Carlisle, Pa.

Dr. Olney B. Monosmith of Lorain, Ohio, has been named as one of the advisory board of Elyria Memorial Hospital.

Dr. M. Fouchard, a prominent ophthalmic surgeon in Paris, known from his classical thesis on glioma retinae, died recently.

Mr. T. H. Bickerton, ophthalmic surgeon to the Liverpool Royal Infirmary, has been made a Commissioner of the Peace for Liverpool.

Dr. and Mrs. P. N. K. Schwenk and son, P. N. K. Schwenk, Jr., of Philadelphia, are spending the summer in Italy, Austria and Germany.

The new examiners in ophthalmology for 1908 at the Royal College of Surgeons of Ireland are A. H. Benson and H. H. B. Cunningham.

A new journal of ophthalmology in the Spanish language is now published at Tartosa, Spain. The title is Hojas Mensuales de Oftalmologie.

Dr. Thomas Reid of Glasgow, N. B., has been given the Order "Commendatore" of the Crown of Italy, as a recognition of his contributions to ophthalmic literature, as recommended by the University of Turin.

The Leipzig Universitäts Frauenklinik has recently honored Credé by the erection of a bust of that eminent gynecologist, to whom ophthalmology owes much for his work in the prevention of ophthalmia neonatorum.

The corner stone of the new hospital for the Harlem Eye, Ear and Throat Infirmary, at Lexington avenue and One Hundred and Twenty-seventh street, New York City, was laid with appropriate ceremonies June 13.

Dr. W. H. de Silva, ophthalmic surgeon to the Ceylon Eye Hospital, and lecturer on ophthalmology in the Ceylon Medical College, died recently after a short illness. He was prominent in government as well as medical circles, being a member of the Municipal Council and a lieutenant of the Volunteers.

Mr. E. Treacher Collins, of London, England, while in Philadelphia during his recent visit to this country, was tendered a luncheon by Dr. Risley, a dinner by Dr. Geo. E. de Schweinitz, a smoker by the ophthalmologists and physicians of Philadelphia, and a luncheon by Dr. L. Webster Fox. While in Philadelphia, Mr. Collins was the guest of Dr. Wm. Campbell Posey.

George La Breche Smith, M. D., Laval University, Quebec, 1899, a member of the medical societies of the state and county of New York, physician to St. Vincent's Hospital, and assistant to the eye, ear and nose clinic at the Polyclinic Medical School and Hospital, New York City, died at his home, June 13, from disease of the stomach, after an illness of several months, aged 43.

The Apotheosis of the Spectacle Maker.

When Charles I. granted a royal charter to the Worshipful Company of Spectacle Makers in 1629, that body represented a well-defined craft. As a matter of fact, the science of ophthalmology, more especially that part dealing with errors of refraction, was as yet unborn. By degrees an accurate knowledge of visual optics and of the physiology and pathology of the complex struc-

tures and phenomena concerned, has been gradually evolved by the labors of medical men. There is probably no branch of medicine which more nearly approaches the level of an exact science than that of the ophthalmic surgeon, and no study that demands greater special aptitude and assiduous study. Yet the spectacle makers have claimed the right to follow on the heels of the scientific ophthalmologist, and to be experts not only in the making of good spectacles, but also in the many abstruse fields of study with which the ophthalmic surgeon must be familiar. From a recently published syllabus, it may be gathered that the company hold three examinations. The first is a preliminary devoted to mathematics (including trigonometry), and to general optics, including the use of the ophthalmoscope, perimeter, chromometer, making of lenses—in short, a general survey of ophthalmic practice. In the final examinations the candidate has to show a knowledge of various instruments, such as the microscope and barometer, and a number of scientific points necessary to the scientific understanding of the human eye, which we should have thought absolutely unnecessary for the man who is to make our lenses and fit our frames. The Worshipful Company, however, is not content until it has imposed a high standard test which would strain the capabilities of many a well-trained medical man to satisfy, even after a long course of special study and experience. The subjects set forth are: "Static and dynamic refraction of the eye. Accommodation and convergence. The movements of the eyeball and muscles employed. The near and far points. The range and amplitude of accommodation and convergence. The course of light through the media of the eye alone and modified by spherical and cylindrical lenses and prisms. Emmetropia, hypermetropia, myopia, astigmatism, anisometropia, aphakia, presbyopia, asthenopia, amblyopia, orthophoria, heterophoria, strabismus, diplopia, the fields of vision and fixation, stereoscopy. Chromatism of the eyes—tests for the same—color vision and blindness." We venture to assume that any spectaclemaker who mastered the foregoing—supposing that were possible for a man without careful medical training—would have little time to devote to his lenses. It would be no less absurd to demand of the ophthalmic surgeon a knowledge of the theory and practice of making spectacles. One of the most curious features of the whole farce is the presence of a member of the Ophthalmological Society upon the board of examiners. If the Society be content, who can differ?—*Ophthalmoscope*, June, 1908.

University of Oxford: Department of Ophthalmology.

A congress of surgeons interested in ophthalmology has for the last two years been held at the conclusion of the post-graduate course of ophthalmology given in the University of Oxford. Last year nearly one hundred gentlemen availed themselves of the invitation to be present. The Reader in ophthalmology, Mr. Robert W. Doyne, has decided to issue a similar invitation this year for Thursday, July 16th, and Friday July 17th. It is the particular wish of the authorities that the Oxford gathering may in no way interfere with the meeting of the British Medical Association to be held later in the month of July at Sheffield, under the Presidency of Mr. Simeon Snell. Indeed, the reader has endeavored to arrange that the Oxford meeting shall to some extent be preliminary and preparatory to the Sheffield one. To this end, Sir A. Wright will give at Oxford an address on vaccine therapy, but will not touch upon sero-therapy, one of the subjects officially chosen for discussion at Sheffield. Again, at Sheffield another official discussion will be on the relationship between diseases of the accessory sinuses and those of the eye and orbit. At Oxford, on the other hand, Mr. A. P. Parker has arranged to give an anatomical display of dissections of the accessory sinuses. Lastly, at Sheffield color-vision and its anomalies will be discussed, while at Oxford experimental demonstrations of the various theories of color-vision will be given. The Oxford program includes, furthermore, the following items:—A demonstration of the Calmette reaction (Mr. P. Adams); Lantern demonstration of retinal disease, with massive exudation (Mr. George Coats); Address on congenital cataract (Mr. E. Treacher Collins); an address by Professor Gotch; Demonstration of some steps in the evolution of the ciliary body and the suspensory ligament (Mr. Graddon); Demonstrations on the theories of color-vision (Dr. Edridge-Green and others); The surgical treatment of optic neuritis (Sir Victor Horsley); Demonstration of points in connection with glaucoma (Mr. Priestly Smith); Exhibition of a reconstruction model of the eye of a human embryo of 13 mm. in length (Prof. Arthur Thomson); A series of microscopical specimens to illustrate certain points in the histology of the foetal eye (Mr. Sidney Stephenson).—*Ophthalmoscope*, June 1908.

Care Required of Persons with Defective Eyesight, Etc.

The Supreme Judicial Court of Massachusetts says, in the case of *Keith vs. Worcester & Blackstone Valley Street Railway Com-*

pany, that the standard of care established by the law is what the ordinarily prudent and cautious person in the full possession and exercise of his faculties would do to protect himself under given conditions. There is no higher or different standard for one who is aged, feeble, blind, halt, deaf or otherwise impaired in capacity, than for one young and in perfect mental and physical condition. The standard is the same for all.

It has frequently, in recent as well as earlier cases, been said, in referring to one under some impediment, that greater caution or increased circumspection may be required in view of these adverse conditions. These expressions mean nothing more than that a person so afflicted must put forth a greater degree of effort than one not acting under any disabilities in order to attain that standard of care, which the law has established for everybody.

When looked at from one standpoint, it is incorrect, to say that a blind person must exercise a higher degree of care than one whose sight is perfect, but in another aspect, a blind person may be obliged to take precautions, practice vigilance and sharpen other senses, unnecessary for one of clear vision, in order to attain that degree of care which the law requires. It may depend in some slight degree how the description of duty begins, where the emphasis may fall at a given moment, but when the whole proposition is stated, the rights of the parties are as fully protected in the one way as in the other. It is perhaps more logical to say that the plaintiff is bound to use ordinary care, and that in passing on what ordinary care demands, due consideration should be given in blindness or other infirmities.

But it is also correct to say that in the exercise of common prudence one of defective eyesight must usually as a matter of general knowledge take more care and employ keener watchfulness in walking on the streets and avoiding obstructions than the same person with good eyesight, in order to reach the standard of excellence established by the law for all persons alike, whether they be weak or strong, sound or deficient.

CHICAGO EYE CLINICS.

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THE OPHTHALMIC RECORD.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|---|---|---|---|------------------------------|
| 9 A.M. | Richard S. Partillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Pol.) Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Pol.) Richard S. Partillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Partillo (P.G.) G. W. Mahoney (Pol.) | |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wipern (E. E. N. T.) | | A. G. Wipern (E. E. N. T.) | A. G. Wipern (E. E. N. T.) | Willis O. Nance (C.C.S.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | | |
| 2 P.M. | L. V. L. Brown (Inf.) J. Gardner (E.E.N.T.) M. H. Levensolin (Inf.) Thos. Faith (E.E.N.T.) W. A. Fisher (E.E.N.T.) E. K. Findlay (Inf.) D. C. Orecutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) D. A. Payne (P.S. Med.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) Wm. H. Williams (Inf.) H. B. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) W. A. Fisher (E.E.N.T.) M. H. Levensolin (Inf.) D. C. Orecutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) Wm. H. Williams (Inf.) H. B. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | E. V. L. Brown (Inf.) W. A. Fisher (E.E.N.T.) M. H. Levensolin (Inf.) D. C. Orecutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) Wm. H. Williams (Inf.) H. B. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) W. A. Fisher (E.E.N.T.) M. H. Levensolin (Inf.) D. C. Orecutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) Wm. H. Williams (Inf.) H. B. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) W. A. Fisher (E.E.N.T.) M. H. Levensolin (Inf.) D. C. Orecutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) Wm. H. Williams (Inf.) H. B. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) | |
| 3 P.M. | W. Allen Barr (C.C.S.) Wm. E. Gamble (P.&S.) | H. H. Brown (Ills. Med.) | J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) Wm. E. Gamble (P. & S.) | Harmon Hazeltine (County) | W. Allen Barr (C.C.S.) Geo. F. Suker (P.G.) | |
| 4 P.M. | W. F. Coleman (P.G.) | C. W. Hawley (P.G.) | G. F. Suker (P.G.) | C. W. Hawley (P.G.) | W. F. Coleman (P.G.) | Brown Puscy (County) |

*Special operative eye clinics.

ABBREVIATIONS:

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|--|---|---|--|
| C. C. S.: Chicago Clinical School, 819 W. Harrison Street. | County: Cook County Hospital, W. | Pol.: Chicago Policlinic and Hospi- tal, 174 E. Chicago Avenue. | Rush: Rush Medical College, W. |
| E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | Harrison and Honore Streets, Ills. Med.: Illinois Medical College, 182 Washington Blvd. | P.G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. | Harrison and Wood Streets. St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
| | Inf.: Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets. | N. W. U.: Northwestern University, 2431 Dearborn Street. | |

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

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PRELIMINARY REPORT OF A THEORY OF THE ETIOLOGY, PREVENTION, PATHOLOGY, TREATMENT AND CURE OF TRACHOMA.

BY FRANK B. EATON, M. D.

PORTLAND, OREGON.

In presenting this theory more or less in mathematical form, I would remind my colleagues that in his "Republic," Plato clearly demonstrates the essential unity of all knowledge.

Mathematical reasoning appeals to me even in the presentation of a theory, since through it the mind is constantly checked and preserved from much hasty assumption.

For fifteen years I have been (with unavoidable interruptions), accumulating clinical records, and gradually formulating a consistent theory of the etiology of trachoma. The following theorems I hope to prove before much time has elapsed, if they are true. If they be true or not, others may be incited by them to prove or disprove them, and, in so doing, advance the cause, not only of science—but what is nobler—the alleviation of much blindness and distress among the poor and afflicted of all countries.

THEOREM I.

Trachoma is primarily an infection of the *blood* by micro-organisms.

Proposition 1. The micro-organisms are protoplasmic bodies.

Proposition 2. These protoplasmic bodies enter the human vascular circulation through the conjunctiva palpebrae, which is the portal of infection.

Proposition 3. They are carried to this portal: (*a*) by certain insects (intermediary hosts), which introduce them into the capillary circulation of the conjunctiva by biting; (*b*) by insects carrying them to the conjunctiva on their legs, mandibles, etc.

Proposition 4. They are of at least two kinds, each developing and propagating differently.

(*a*) One kind, the *xerogenous* (*Koch*) parasite, is introduced into the conjunctival vessels by the bite of the intermediary host.

(b) The other, the *endogenous* parasite, is carried to the conjunctiva as stated in Proposition 3 (b).

Proposition 5. The life cycle of the exogenous parasite includes a primary, an intermediary, and a human host.

Proposition 6. The life cycle of the *endogenous* parasite begins and is completed within the blood and tissues of human beings, and probably certain birds and monkeys.

THEOREM II.

Proposition 1. The *primary host* of the *exogenous* parasite is the horse, and probably other animals and birds.

Proposition 2. The *intermediary* hosts are certain biting flies, gnats, and possibly other insects.

Proposition 3. The *final* host is the human body.

THEOREM III.

Proposition 1. The *endogenous* parasite infests and infects certain animals and birds, beginning its existence and completing its life cycle within their blood and tissues.

Proposition 2. This parasite, carried to the conjunctiva palpebrae by the legs, bodies, etc., of insects (*Prop. 3, Theorem I*), begins and completes the cycle of its life within the human blood and tissues. (*Prop. 6, Theorem I.*)

Proposition 3. This parasite gains access to the human vascular system by way of the capillaries of the integument and conjunctiva palpebrae.

THEOREM IV.

Only the *endogenous* parasite is infective from the human being to another; it therefore follows that according to

THEOREM V.

Proposition 1. There are at least two similar but distinct diseases which are clinically termed *trachoma*, but which are, in reality biologically sharply defined from each other, however much they seem to resemble each other clinically; and also pathologically. One is contagious; the other is not.

Proposition 2. The contagious form of trachoma has, as its essential cause, the *endogenous* parasite.

Proposition 3. The non-contagious form of trachoma has, as its essential cause, the *exogenous* parasite.

THEOREM VI.

Proposition 1. It follows that if, according to *Theorem I*, trachoma is primarily an infection of the blood, there should be in the chronic form of both forms of the disease, a *cachexia*.

Proposition 2. It also follows from Proposition 3, Theorem I, that both forms of the disease should be prevalent where there are many biting and non-biting insects (stables, cattle-pens, in insect-infected countries, etc., and where there is filth).

THEOREM VII.

Proposition 1. The prevention, treatment and cure of both forms of the disease should be most successful and prompt by the application of the principles contained in the theory of thyroidase (opsonin). Next to this come the various forms of constitutional treatment, such as serum antitoxins, etc.

Proposition 2. When the so-called "granulations" appear near or upon the surface of the conjunctiva, the disease should, to an extent, be approximately curable by local remedies, or any means which, by producing venous stasis, and thus phagocytosis (Bier's principle, gonorrhoeic virus, jequirity, cupric sulphate, etc.), destroy the protoplasmic bodies. Yet,

THEOREM VIII.

Proposition 1. While often apparently cured by local remedies, unless the protoplasmic bodies are totally destroyed in the blood, the disease should recur, or, only the symptoms temporarily disappear.

Proposition 2. Fresh air, exercise and all hygienic measures should, within certain limits, prevent and alleviate the disease.

Per contra, deficient ventilation, crowding of the afflicted, flies, filth, etc., should tend to intensify and spread the disease.

THEOREM IX.

The human body, being the final host, all animals (except perhaps certain monkeys) and birds should be exempt from the disease, and perhaps certain of the human races.

THEOREM X.

Proposition 1. The primary hosts (*Prop. 1, Theorem II*) should be found infected with the *primary* (embryonic) form of *exogenous* parasite.

Proposition 2. The *secondary* form of the exogenous parasite, after migration, should be found in the body of the intermediary hosts. (*Prop. 2, Theorem II.*)

Proposition 3. The *tertiary* form of the *exogenous* parasite should be found in the blood and tissues of the final host, *i. e.*, the human body.

Proposition 4. The *endogenous* parasite will probably be found in the blood of only birds, monkeys and human beings. (*Prop. 6, Theorem I.*)

All these ten theories, as above presented, I hope to prove. Some of them I have the proof of in my records of cases of trachoma going back to the year 1882, and on to the present time.

But the crucial test of this theory will be the proof or disproof of Theorem X. Koch's law I believe to be as inexorably true as that of gravitation.

As I have stated at the beginning of this report, if my theory be proved or disproved by myself and others—and time will tell—we will nevertheless have advanced the cause of science one step nearer to the Truth, and perhaps hasten the day when one of the scourges of mankind shall be conquered and the poor and afflicted blind relieved and cured in all countries.

A CASE OF SIDEROSIS OF THE RIGHT EYE, CAUSED BY
A PIECE OF IRON-SCALE, WHICH THE X-RAY
FAILED TO LOCATE.*

HENRY MUETZE, M. D.

ST. LOUIS.

I wish to present this evening a case which adds further proof to the observation that the X-ray sometimes fails to reveal the presence of a small metal body in the interior of the eyeball.

The patient a cabinet maker, now 19 years of age, was referred to me in the afternoon of September 27, 1901, stating that in the morning while trying to cut off a bolt a piece of iron scale from the latter struck him in the right eye. He said it bled a little at the time but he washed it off, and as it did not cause any pain or annoyance he continued his work till afternoon.

Upon examination I found a shallow cut in the outer part of the margin of the right lower lid, a small perforating wound in the inferior exterior quadrant of the cornea and an iridio-dialysis corresponding to the site of the corneal wound. The iris reacted sluggishly, but the pupil dilated rapidly under atropin and ophthalmoscopic examination revealed a small dark opacity in the lower outer quadrant of the lens. The other media were clear, the fundus appeared perfectly normal and vision was 20/20. The patient had no conception of the size of the piece which struck him, but thought that it must have been very small. Atropine and argyrol solutions externally and iodide of potassium and proto-iodide of mercury internally were prescribed. The eye was bandaged and the patient was sent to the X-ray specialist for ex-

*Read to the Ophthalmic Section of the St. Louis Medical Society, March 11, 1902.

amination. To my surprise the result proved negative. Not satisfied, however, I had another examination made two days later with the same findings.

Having thought at first that I had seen a small dark object in the lens, especially when examining laterally, I now concluded that I must have mistaken the traumatic cataract for a foreign body, and that possibly a larger piece of iron might have struck the eye and then dropped off. (I have a case of this kind under my care now.) The corneal wound healed rapidly, the iritis subsided, the opacity in the lens did not grow any larger and three weeks after the injury I discharged patient with normal vision, cautioning him to report as soon as the eye would give him the least trouble.

January 28, 1905, four months after the injury, he presented himself again for reading glasses: the condition of the right eye was still the same.

September 15, 1905, about one year after the injury, he returned, complaining of a very rapid decrease of vision in the right eye. I found that the entire lens had become cataractous, reducing vision to 20/150, and also noticed a marked discoloration of the iris. Naturally of a light gray, it had now assumed a dirty brown color; it was rust stained, so to speak. This was certain proof that my original diagnosis of the presence of the piece of iron in the lens was correct, and that the X-ray failed to reveal it.

I assured the patient that as soon as perfectly mature I would remove the cataract. From that time up to the time of the operation he had several attacks of iritis, which were easily controlled, however, by atropine, iodide, mercury and hot compresses.

As I found his light projection was very poor, I did not make a very favorable prognosis regarding vision. The entirely successful operation of extraction of cataract with iridectomy was performed October 19, 1907.

I examined the heavily rust stained lens very carefully, hoping to find the small piece of iron, but my search proved futile. Evidently rendered soluble by the carbon dioxide of the tissues, it was absorbed by the lymph current to be precipitated as iron hydroxide, causing a severe chronic uveitis, from the ravages of which the eye is still suffering at present.

Since the operation the eye has been perfectly quiet. There is general cloudiness of the vitreous, with numerous large and small floating opacities. No details of the fundus are discernible. The patient is still taking proto-iodide of mercury and vision is improving.

$1 = 5/08.$

With 11.00 D. S. $V = 1/20.$

$11 = 21/08.$

With 11.00 D. S. $1/10.$

The question now arises:

Why did the X-ray fail to locate the piece of iron scale?

Since I have had this case under my observation, the answer does not appear difficult. Iron scale, though very hard and capable of deep penetration, is generally thin and does not offer sufficient resistance in its shorter diameter to be appreciated by the plate. In its longer diameter it would not make an impression owing to diffusion of light rays, caused by the cranial bones.

Although I consider the result in this case a good one under the circumstances, I believe that in the future I would give the patient the benefit of the doubt and in addition to X-ray examination would call to aid the giant magnet.

THE CULTIVATION OF THE MENINGOCOCCUS FROM EYE CONDITIONS COMPLICATING EPIDEMIC CEREBRO-SPINAL MENINGITIS.*

BY HANFORD MCKEE, B. A., M. D.

(From the Pathological Laboratory of the Montreal General Hospital.)

Metastatic ophthalmia occurring in epidemic cerebro-spinal meningitis is not a rare condition. Many of these cases are mild and undoubtedly have in the past been often overlooked. Many of them have been discovered only at autopsy. The percentage of cases of meningitis complicated by metastatic ophthalmia is given by Knapp as 1 to 5, by Heine as 5 and by Elthoff as 4 per cent. The affection occurs as a rule in one eye, but has been reported in both by Knapp in one of ten cases, by Kreitzmaier in one of twelve cases, by Seggel in one of four, by Elthoff in two of eleven, by Heine in two of five, by Markuse in one case and by von Graefe in three cases. The clinical picture is a characteristic one and has been well recognized for years. Early in the course of the disease, generally between the first and third weeks, there suddenly appears a hypopyon iritis with exudation in the pupillary area. This condition very quickly assumes the well-known picture of pseudoghonima. Often the characteristic yellowish appearance in the pupillary area is the first symptom pointing to any ocular complication.

*Read before the Section of Laboratory Workers at the Canadian Medical Association, Montreal.

While the condition has been well recognized clinically a bacteriological examination has been made in only a very few cases. Uthoff upon three occasions tried to obtain the micro-organism by aspirating the vitreous, but with negative results. Axenfeld aspirated the anterior chamber and found microscopically Gram negative diplococci. Cultivation was, however, unsuccessful. From an eye examined at post mortem Axenfeld later cultivated the meningococcus. Hanke and Tertsch have lately reported an interesting case. A seven months old child was referred to the eye clinic from the children's hospital with the diagnosis of "inflammation of the lungs." The mother stated that eight days after the beginning of the illness she had noticed an "an opacity of the right eye and the pupil had disappeared." At the first visit to the eye clinic a metastatic ophthalmia was diagnosed. (Irido-choroiditis chronica with pupillary and vitreous exudation.) In the lower quadrant near the equator was noticed a bulging. When the child was brought back again eight days later a thick yellowish discharge was seen coming from the former prominent part. Markuse has also reported spontaneous perforation of the globe by a suppurative process caused by the meningococcus.

We had last year at the Montreal General Hospital a case of metastatic ophthalmia occurring in a case of epidemic cerebro-spinal meningitis. The case was as follows: Child, W. J. A., aged seven years, was seized June 9, 1901, with vomiting of blood-stained fluid. A few hours later he complained of pain at the back of his neck and frontal headache. He was admitted to the hospital at noon of the same day and became unconscious a short time after admission. When admitted he had in each eye bright subconjunctival hæmorrhages and during the next day there developed a hypopion in the right eye. The patient died June 11. The diagnosis was epidemic cerebro-spinal meningitis. At the post mortem the right cornea was seared with a hot surface. With a sterile hypodermic syringe the pus was withdrawn from the anterior chamber and was planted on hæmoglobin agar by carefully spreading the material over the surface of the medium. After twenty-four hours at 37° C. the growth was so thick that isolated colonies could not develop. The micro-organism was a Gram negative diplococcus which coincided in every particular with the Gram negative diplococcus isolated from the cerebro-spinal fluid, i. e., meningococcus.

Axenfeld in writing on metastatic ophthalmia cites a case of

Wintersteiner's and one of his own. There are also doubtful cases reported by Saltini, Silcock, Treacher Collins, Mayou and others. Wintersteiner saw in cut sections of a bulbous from a meningitis case Gram negative diplococci, both intra and extra-cellular. Uthoff also found in sections Gram negative diplococci. Weichselbaum mentions the above case of Wintersteiner's and a case reported by Stevenson. The latter was a case of panophthalmitis in the pus of which, associated with other bacteria, were found meningococci. Tooke reported a case of "hypopyon iritis associated with epidemic cerebro-spinal meningitis." There was, however, no bacteriological examination made of the pus in the anterior chamber.

It will be seen that a bacteriological examination with a differentiation of the Gram negative diplococci has been made in only three cases, that of Axenfeld, that of Hanke and Tertsch, and the one here reported. The mere stating meningococci were found is not sufficient. In discussing Gram negative diplococci found in the eye it is necessary to differentiate between the gonococcus, the micrococcus catarrhalis, and the meningococcus. That the gonococcus is a frequent factor in inflammation of the eye is well known. The micrococcus catarrhalis has been isolated from some catarrhal conjunctival conditions and from some cases of purulent ophthalmia, while the meningococcus has been cultivated both from the pus of the anterior chamber and from the conjunctiva, so that for diagnostic purposes the examination of a smear alone is of practically no value unless followed by cultivation and study of the micro-organisms. One would think the finding in a smear of Gram negative diplococci in eye conditions complicating meningitis ought to be proof of their being meningococci, but such is not the case. From Axenfeld's clinic last year was reported the isolation of the micrococcus catarrhalis from the conjunctiva of a patient ill with epidemic cerebro-spinal meningitis. Had the diagnosis been left to the morphology of the organism, it would naturally have been diagnosed meningococcus conjunctivitis. So much careless eye bacteriology has gone on record it is high time we demanded from ophthalmologists the same proof of their results that we receive from others. When one finds in recent publications "Weichselbaum's biscuit-shaped coccus" being described as "surrounded by a clear space very much the same as that found between the organism proper and its containing capsule," or when one sees a photograph of beautiful lanceolate diplococci described as meningococci, the necessity for greater

care in diagnosis will be readily seen. The finding of diplococci or "bodies in the tissues resembling the meningococcus" is not sufficient to warrant the statement that these were meningococci. The staining of Gram positive organisms in tissue is a simple procedure; on the other hand, the staining of Gram negative bacteria, and especially the meningococcus, is a matter requiring special technique and very great care. If in staining tissue by one of the ordinary methods, diplococci are found, we may be sure they are not Gram negative organisms. For obvious reasons Gram negative bacteria will not be stained by such methods. Duval has recently described a method of staining Gram negative organisms in tissue. I have seen some very pretty slides showing gonococci stained in the tissues and would advise its use for the meningococcus, but the latter organism will be found even harder to stain than the gonococcus. The demonstration of Gram negative diplococci in smears, especially in eye bacteriology, is not sufficient to name the organism. Only lately I obtained upon three occasions the micrococcus catarrhalis from inflamed conditions of the conjunctiva. In the smears they were intra and extracellular and without cultivation would have been diagnosed gonococci, so that to differentiate the Gram negative diplococci of the conjunctiva, even in cases of epidemic meningitis, a study of the cultural features of the organism is necessary.

Conjunctivitis as a complication of epidemic cerebro-spinal meningitis has long been recognized. Among 111 cases of meningitis Councilman saw ten complicated with conjunctivitis, among thirty Davis saw eight with the same complication. Robinson stated purulent conjunctivitis was a not infrequent complication of meningitis, but unfortunately the bacteriological examination was not often reported. Ballantyne in a paper on "Ocular Symptoms in Cerebro-spinal Meningitis" stated hyperæmia of the bulbar and palpable conjunctiva occurred in many cases. A certain degree of bulbar injection is quite common even in the first few days and may persist for some time. Among the seventy-three cases examined thirteen had acute catarrhal conjunctivitis with more or less purulent discharge. In the majority it was a symptom of the early acute stage, but in several appeared in late stages and might well have been due to outward infection from the incomplete closure of the lids. No attempt was made to work out the bacteriology of the discharge. In two cases conjunctival hæmorrhages were present. McGregor, who mentioned this symptom to Ballantyne, saw conjunctival hæmorrhages quite frequently in

the earlier cases of the Glasgow epidemic. They were usually during the acute stage and even in the absence of such spots on the skin. They go so far as to suggest (1) as conjunctival hemorrhages are rare in acute illnesses except whooping cough, their presence in a patient suspected should carry some weight, and (2) conjunctivitis which occurs as an early symptom would most likely help to distinguish this from other forms of meningitis.

The fact that the meningococcus has been isolated from the conjunctival discharge in a few cases has added interest to conjunctivitis as a symptom. According to Axenfeld, Frankel reported a severe pseudo-membranous conjunctivitis in three children of one family due to a diplococcus which he thought was the meningococcus. Hagland also described a case of meningococcus conjunctivitis. Both these cases are now discredited. Wintersteiner reported a case of ophthalmia occurring in the course of meningitis. In cover-slip preparations from the conjunctiva an organism identical in morphology with the meningococcus was obtained. Weichselbaum studied Wintersteiner's preparations and although no cultures were made he considered the finding positive. Wintersteiner believed the infection a metastatic one. According to Axenfeld, Koplick in Washington in 1904 reported finding the meningococcus in the conjunctival sac in a case of epidemic meningitis. D. Smith in the Archives of Ophthalmology reported among 100 cases of conjunctivitis one due to the meningococcus. No differential diagnosis, however, was given. Gabrielides in a child of twenty-five months with meningitis found in the conjunctiva, xerosis bacilli, pneumococci and Gram negative diplococci, intra and extracellular, which coincided in every way with the Gram negative diplococci from the cerebro-spinal fluid. E. S. Thompson at the American Medical Association, 1906, reported finding the meningococcus three or four times among 100 cases of blenorrhoea. Differentiation here is, however, unsatisfactory. Robinson from one case of meningitis isolated the meningococcus from the purulent discharge. In three other cases of conjunctivitis the finding was negative. In spite of these reports at a meeting of the Ophthalmological Society of Paris, December 31, 1904, when Moissonnier reported a case of meningococcus conjunctivitis Morax said: "As yet there has been no authentic case of meningococcus conjunctivitis reported. The case reported by Moissonnier is neither clinically nor bacteriologically satisfactory."

During the last year I have had an opportunity of seeing six cases of epidemic meningitis with conjunctival symptoms:

(1) An adult male, aged 23 years. Marked catarrhal conjunctivitis, smear negative. Culture staphylococcus aureus (in pure culture).

(2) An adult male, aged 18 years. Purulent conjunctivitis both eyes. Smear negative. Culture meningococcus.

(3) Child, aged 3 years. Catarrhal conjunctivitis both eyes. Smear Gram negative diplococci. Culture bacillus influenzae.

(4) Child, 7 years. Catarrhal conjunctivitis both eyes. Smear Gram negative diplococci. Culture meningococci.

(5) Child, aged 7 years. Catarrhal conjunctivitis both eyes. Smear Gram negative diplococci and Gram negative diplobacilli. Culture diplobacilli and *B. exerosis*.

(6) Child, aged 9 years. Sister to case 5. Catarrhal conjunctivitis both eyes. Smear Gram positive cocci and Gram negative bacilli. Culture staphylococcus albus and bacillus influenzae. In each case the diagnosis was made by cultural tests. In cases 3 and 5, although characteristic Gram negative diplococci were found in the smear preparation, the conjunctivitis has been placed as due to the organisms cultivated. In all the cases the conjunctivitis was in the early stage of the disease. In only one case was there much purulent discharge. This was, strangely enough, one of the meningococcus cases. In all the meningococcus was cultivated from the cerebro-spinal fluid.

The diagnosis of conjunctivitis due to the staphylococcus, diplobacillus and the bacillus influenzae is a simple matter, but not so with the meningococcus. The latter can only be diagnosed by careful cultural examination. All Gram negative diplococci in conjunctivitis in meningitis cases are not meningococci, as from Axenfeld's clinic last year was reported the finding of the micrococcus catarrhalis from a conjunctivitis in a patient with meningitis. Leaving out of consideration the Gram negative diplococci described by Bumm and those of Lingelsheim, the three Gram negative diplococci to be discussed in differentiating conjunctival micro-organisms are the gonococcus, the meningococcus and the micrococcus catarrhalis. The differentiation between these three has been carried out in our cases by a comparison of the following points: Growth by room temperature, growth on plain agar, hæmoglobin agar, gelatine, Loeffler's blood-serum, potato, bouillon, Litmus milk, a comparison of their action on the sugars and a comparison of their length of viability.

Where Gram negative diplococci grow by room temperature and are viable on plain agar for weeks or months, the gonococcus

and the meningococcus are excluded. The micrococcus catarrhalis is so easily differentiated the question comes to be really a decision between the gonococcus and the meningococcus. In the initial tube a growth of the meningococcus upon plain agar is not rare whereas a growth of the gonococcus upon this medium is. Upon haemoglobin agar they each have a characteristic appearance which is constant. The meningococcus grows profusely with a large raised growth which has somewhat of a bluish tinge. The gonococcus, on the other hand, has a fine, slightly raised, moist-looking, colorless growth, vastly different in appearance. After considerable experience with the cultivation of different cultures of these two micro-organisms I feel convinced the most satisfactory medium for their cultivation is human haemoglobin agar. They each grow profusely upon this and I believe the appearance of each upon this medium will help to a considerable extent in their differentiation. Upon gelatine they do not as a rule grow. Upon blood-serum the meningococcus grows fairly well, while the gonococcus does not. Upon potato the meningococcus grows at times, the gonococcus never. In bouillon the meningococcus grows with turbidity of the medium, the gonococcus does not grow. In Litmus milk the meningococcus sometimes give a slight growth, the gonococcus never. On the sugars the meningococcus ferments maltose and dextrose, while the gonococcus only the dextrose. The period of viability is much less in the meningococcus than in the gonococcus. To insure cultivation the meningococcus must be transplanted every forty-eight hours. With this precaution very frequently the culture will be lost. The gonococcus, however, can be carried along very nicely by transferring every forty-eight hours and after cultivation for some time transplanting may be deferred for a day or two longer. These are some points noted during the last year while having the gonococcus and the meningococcus in different strains under constant cultivation. The strains differ in detail, but the gonococcus and the meningococcus when their cultural features are compared give ample ground for differentiation.

The first report of meningococcus from the conjunctival sac of a patient not ill with meningitis was from Axenfeld's clinic by Brons. The case was one of Keratomalacia from pneumococcus infection. From the conjunctiva for a period of two weeks were isolated meningococci. The third case of meningococcus from the conjunctival sac which I have to report is the isolation from an apparently normal eye. A young Jewish boy, number 279, 1908, came to the out door last February to have his eyes tested

for glasses. As I was examining a series of normal conjunctivæ at that time I chose his conjunctiva to take cultures from. Tubes of hæmoglobin agar, bouillon and plain agar were inoculated. The growth on hæmoglobin was profuse, so much so I believed it to be *micrococcus catarrhalis*, but in putting it through the tests given above I proved it to be the meningococcus. This I believe is the first instance reported of the cultivation of the meningococcus from a normal eye. While the cultivation of the meningococcus from the conjunctiva of patients ill with meningitis is interesting, the cultivation from a normal conjunctiva is even more so. The presence of the meningococcus on the nasal mucous membrane of supposed healthy individuals has been shown. Is the presence on the conjunctiva secondary to its presence in the nose or may the conjunctiva, too, be a point of entrance?

Briefly, then, during the last year we have seen at the Montreal General Hospital seven cases of epidemic cerebro-spinal meningitis with ocular symptoms. These seven cases consisted of one case of metastatic ophthalmia and six cases of conjunctivitis. From the pus in the anterior chamber of the hypopion iritis case and from the conjunctiva in two cases of conjunctivitis were cultivated Gram negative diplococci which were carefully studied and shown to be meningococci. To this is to be added the cultivation of the meningococcus once from the normal conjunctival sac.

I take great pleasure in expressing my thanks to Dr. Duval for his supervision of this work.

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A PIECE OF STEEL WEIGHING LESS THAN A MILLI-GRAM, SUCCESSFULLY REMOVED FROM THE VITREOUS WITH RESULTING NORMAL VISION.

BY CHARLES NELSON SPRATT, B. S., M. D.,

MINNEAPOLIS.

ILLUSTRATED.

History. On April 11, 1908, C. K., age 28, a machinist, was struck in the right eye by a particle from a cold chisel. After the temporary discomfort had passed away he continued his work for six days, when the eye became red and painful and the vision was slightly blurred. Two days later he consulted an ophthalmologist, who tried to remove the suspected foreign body with a giant magnet. The following day the giant magnet again failed to remove the steel.

The eye was quite painful, and as it seemed impossible to remove the foreign body, the surgeon advised enucleation.

The patient was seen by the writer April 24, ten days after the injury.



*Crescent-shaped area is the seat of the incision through which the foreign body was removed. Crescent-shaped area below is the wound in retina made by the steel. Two greenish yellow strands extend into vitreous from this.

Examination. A. O. D. 2/10. Marked ciliary and conjunctival injection. Cornea clear. In the superior temporal quadrant, at the limbus, is a faint scar 1 mm. long. The anterior chamber contains a small hypopyon; pupil is round and

moderately dilated; iris discolored; lens clear; fundus not seen on account of hazy vitreous. There is no wound of iris or lens corresponding to the corneal scar.

V. O. S. = 6/5.

Two skiagraphs were made and after Hulen's method a foreign body was located in the external wall of the eye about 14 mm. back from limbus on a level with the horizontal plane of the eye.

Operation.—Under cocaine anesthesia, the conjunctiva over the external rectus was divided, the muscle was retracted downward and a horizontal incision, 3 mm. long was made through the sclera with a narrow cataract knife, just anterior to the location of the foreign body. The tip of a Shields magnet, connected directly to a 110 volt current, was introduced into the opening. A scale of steel 1 mm. in longest diameter and weighing 0.7 mm. (1/93 gr.) was removed from the eye. A small bead of vitreous presented in the wound. The episcleral tissue and conjunctiva were closed with a fine silk suture. Atropin was instilled and both eyes bandaged.

Healing was uneventful. The hypopyon disappeared in 48 hours. Patient returned home on the 14th day after operation, eye almost white. V. O. D. = 6/12. Vitreous hazy due to clots of blood.

Patient was seen June 19, 1908, and V. O. D. = 6/5. The ophthalmoscope showed a yellowish spindle-shaped scar; below this and posterior is a crescent-shaped area in the retina caused by the steel. Two strands of a greenish-yellow color project 6-8 D. into the vitreous from below the wound caused by the foreign body.

Remarks: (1) The use of the giant magnet for diagnosis is not an accurate or scientific procedure. The foreign body may be held down by exudate or may be too small (as in the above case) to be attracted by the magnet.

(2) The rational and scientific treatment of suspected foreign bodies in the eye demands the knowledge of their exact location.

(3) An incision through the sclera near the position of the foreign body will heal as quickly as a corneal incision and offers a direct route for the removal of the steel with no danger of injury to lens, iris or ciliary body as may follow the removal through the cornea with the giant magnet.

(4) The tip of a powerful hand magnet introduced into the

eye near the location of the foreign body (iron or steel) will often attract the object when the giant magnet will not.

(5) This case illustrates the fact that very minute particles of steel or iron can be accurately located and successfully removed from an eye, with perfect vision resulting.

A NEW KNIFE AND METHOD FOR IRIDOTOMY.

BY DR. GEORGE B. JOBSON, JR.

FRANKLIN, PA.

ILLUSTRATED.

In common with other operators, we have found difficulty in making an artificial pupil in those cases in which, after lens removal or otherwise, the pupil becomes occluded.

In these cases the iris is often so much thickened and toughened and so much new tissue is formed that the usual methods are difficult and often ineffective. To cut an opening in this toughened tissue frequently involves an amount of traumatism almost prohibitive.

Fig. 1

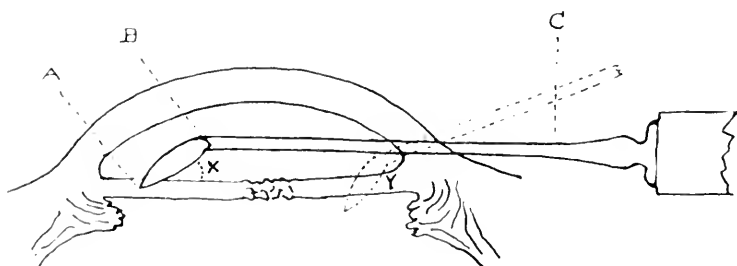
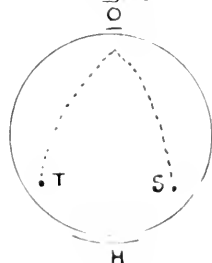


Fig 2



In the attempt to obviate this difficulty, Dr. Henry P. Hammond and I have devised a knife that has given us much satisfaction. It is somewhat similar to a cystotome with a large blade set at a carefully calculated angle but differs in that a cystotome, no matter how sharp, when engaged in a tough, somewhat loose

membrane, acts like a hook to drag and not to cut and also requires a preliminary incision for its introduction. This knife on the contrary makes its own incision in the globe and cuts with a minimum amount of dragging.

The blade "A-B" (Fig. 1), is made very thin and broad and sharp-pointed and is as long as the distance from the posterior surface of the cornea to the iris will permit. It is set at such an angle to the shank as will make the minimum of angle between it and the iris "X" to prevent dragging yet so as to have dip enough to reach downward and to cut as closely as possible to the point of entrance "Y." The shank "B-C" is round and of a circumference equal to that of the flat blade so that it will fill the hole made by the blade and prevent the escape of aqueous while working.

In using the knife, we have found the following method for producing an artificial pupil of great utility:

The knife is entered on the flat at the upper sclero-corneal junction, "O" (Fig. 2). Keeping it flat and the handle nearly horizontal, the point is passed to the opposite side near the junction of iris and cornea "T." It is then turned point down and made to penetrate the membrane and with a drawing cut the incision "T-O" is made. In the same manner the incision "S-O" is made, taking care to have them meet near "O." These incisions are the more easily made, as they are in a direction opposite to a firm attachment of the iris, which is thereby kept taut while cutting. The knife is then withdrawn and the small hole in the globe closes perfectly as with a Graefe's knife.

The resulting flap, "T-O-S," is then dealt with as seems best. In most cases an incision is made at the lower sclero-corneal junction, "H" iris forceps introduced, the flap pulled out and cut off with iris scissors as in an ordinary iridectomy.

The knife will also be found useful in other cases, as for incising the capsule of the lens instead of using a cystotome, etc.

TOXIC SYMPTOMS FOLLOWING THE INSTILLATION OF HOMATROPIN HYDROBROMATE.

C. M. HARRIS, M. D.,

JOHNSTOWN, PA.

I am induced to report this single case because of my belief that there is a very general impression that homatropin and its salts are practically free from toxicity when used in proper strength for ocular instillation. On referring to prominent text-books, I

find no mention made of even such a possibility, and I have read few reports of such happenings. Such a disagreeable and unfortunate experience serves to emphasize the value of the routine practice of making digital pressure over the inner canthi after ocular instillation of poisonous drugs. In view of the fact that homatropin hydrobromate is used so frequently, often in strong solutions, and in sensitive neurotic individuals, I think it remarkable that we hear of so few instances of systemic effects. I have used hyoscin hydrobromate, and scopolamin hydrobromate in 1/10 per cent solution far more frequently in refraction, and beyond occasional pharyngeal dryness have never noticed an untoward symptom. I mention this on account of having frequently read the warning that these two drugs are dangerous.

My patient was a married woman, aged 35 years. She was apparently in good health, but I learned later that she possessed an unstable nervous system, which was a family characteristic. As she lived eighteen miles in the country, and could only devote a part of one day to refraction, homatropin was decided upon as a cycloplegic. The solution used was purchased by the writer, and was compounded by a careful pharmacist, who was positive that no mistake had been made. Merck's product was used. The proportions were: Homatropin hydrobromate, gr. $\frac{1}{2}$; Aq. Dest. m. xxiv. One drop was instilled into each eye at 12 o'clock noon, and she was told to return at 2 p. m. At this time the instillation was repeated, followed by two more at ten minute intervals.

Within a half-hour she complained of feeling "light-headed," and of a dry sensation in her throat. In less than ten minutes from this time her voice became thick and her statements were irrational. Hallucination of sight, and apparently hearing, were present. Muscular prostration and inco-ordination were pronounced, she not being able to stand alone and grasp an object with any certainty. The face was slightly flushed and the pulse, while somewhat accelerated at first, became slow and moderately full within an hour. Vomiting occurred during the second hour, but the cause was uncertain, as goodly doses of aromatic spirit of ammonia had been given. At 6 p. m. some improvement was noted and she was removed in a cab to the house of a relative. A rational state of mind and a practical recovery of other functions was attained at about 9 p. m. At no time during the afternoon was drowsiness noted. Mild excitement was the rule. She was able to be driven eighteen miles to her home on the following morning, and suffered no further ill effects from the drug.

BRIEF REPORT OF A CASE OF HALLUCINATION AND
OTHER NERVOUS SYMPTOMS COINCIDENT
WITH ASTIGMATISM SEEN AND COR-
RECTED TEN YEARS PREVIOUSLY.

BY DR. JUAN SANTOS FERNANDEZ,

OF HAVANA, CUBA.

On the 21th day of January, 1899, Mr. X. of Havana, Cuba, came to see me professionally. He brought a note of introduction from Dr. Charles A. Oliver of Philadelphia, Pennsylvania, United States of America, in which I was asked to re-study and to report upon the patient's ocular conditions. Dr. Oliver stated that through the kindness of Dr. S. Weir Mitchell of the same city, he had had the privilege of studying and correcting the eye disturbances during the winter of 1896 and 1897.

The patient was a thirty-five year old attorney, a native of the West Indies. He was one of a family of ten children, eight of whom (four boys and four girls), were living and healthy. The patient had been free from all diseases of childhood except rubeola. His parents were living, the father being gouty.

His attacks, Dr. Oliver informed me in his note, were right-sided migrainous in character, followed at times by epileptic seizures—the aura being visual in character and consisting of a gladiatorial dwarf who rapidly approached from a distance, increased in size, and felled the patient to the ground. They took place in warm weather, and had increased in frequency and severity.

The refraction (a low amount of myopia and a high degree of astigmatism in the right eye, with a low amount of nearsightedness in the left eye), had been corrected by Dr. Oliver, and the glasses worn conscientiously for several years. Dr. Mitchell's careful course of treatment in important rules of hygiene had been continuously followed for a long period of time.

At the time I saw the case—three years after it had been first studied, and two years after the local and general signs and symptoms had ceased, I went over the eye conditions systematically, and found them, as had been reported to me by Dr. Oliver. I did not find it necessary to make any change in the glasses.

At present, 1907—nearly ten years after the disappearance of the hallucinations—I find that the patient is well and hard at work in his profession: his ocular and general functions being performed satisfactorily and without organic disturbance.

AN UNUSUAL DEGREE OF MYOPIA IN A PURE-BLOODED NEGRO.

BY CHARLES W. KOLLOCK, M. D.,
CHARLESTON, S. C.

Myopia in the pure-blooded negro is rare, even after more than forty years of freedom and more or less education. Among the mulattoes refractive error are almost as common as among the whites. In the pure negro I have seen but two cases of myopia among several thousands whom I have examined. One of these was a minister who had between 2 and 3 D, but the other was of greater interest and in my experience unique. E. J., female, pure black, aged 22, pupil in a training school for nurses, consulted me about her vision April 16, 1907. She said that she had always been near-sighted and had worn glasses for twelve years. Homatropin was instilled for examination with this result: R. E. 1 cc, with —12, 15/xxx? L. E. 3/cc, —18, 15/L? — 12 was given for both eyes and, at last accounts, had proved satisfactory. In this case the usual pictures of high myopia were seen by the ophthalmoscopic examination.

Two cases that occurred in mulattoes may be mentioned—one of "gingerbread" color, aged 16 years, had 15 D myopia in each eye, and the other, a very bright mulatto, aged 19 years, had 18 D in the right and 11 in the left. The first case is very rare and the other two are, at least, unusual.

New Books

Bier's Hyperemic Treatment, by Willy Meyer, M. D., and Prof. Victor Schminiden. Bier's Hyperemic Treatment in Surgery, Medicine and all the Specialties: A Manual of Its Practical Application. By Willy Meyer, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; and Professor Dr. Victor Schminiden, Assistant to Professor Bier at Berlin University, Germany. Octavo of 209 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1908. Cloth, \$3.00 net. W. B. Saunders Company, Philadelphia and London. While this book is devoted chiefly to the general application of Bier's Hyperemia Treatment, it also contains short chapters on its special application in diseases of the eye, ear, nose and throat.—Ed

Reports of Societies

THIRTEENTH ANNUAL MEETING OF THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY, CLEVELAND, OHIO.

The Limitations of Ophthalmic Practice.

In the president's address, delivered before the American Academy of Ophthalmology and Oto-Laryngology, at its thirteenth annual meeting, held in Cleveland, Ohio, August 27, 28 and 29, 1908, Dr. Derrick T. Vail, of Cincinnati, in an address on "The Limitations of Ophthalmic Practice," called attention to the brilliant achievements in the development of scientific ophthalmology in the last half century, and considered what rightly constitutes the practice of ophthalmology, its limitations or boundary lines. He said the subject divides itself under the heads of the Field of Study and the Field of Practice. Under the former head are included all other branches of medical science, plus an intimate knowledge of the ocular structures. The ophthalmic surgeon must be a qualified doctor of medicine and surgery who practices ophthalmology, because there is at least an indirect connection between the eye and every organ and working part of the entire human organism. It is also necessary for the oculist to be well posted in allied or collateral sciences, such as climatology, hygiene, sociology, physics, psychology, evolution, heredity, race, diet, habits, occupation, plant life, germ life, etc., so that one may come to the conclusion that the field of study for ophthalmology embraces the "heavens above, the earth beneath and the waters under the earth, and all that in them is."

The field of practice embraces all the therapeutical and surgical procedures in vogue for correcting the diseases and anomalies that affect the eye alone, which brings one to the consideration of what constitutes "the eye alone."

The eye is the organ of vision, but this does not mean the eye-ball alone, for that is but the distal end of the organ of vision; but every part of the apparatus by which we see. This includes the orbital contents, the bony walls of the orbit, the optic tracts, the nerves furnishing the impulses called sensation and motion, their origin, course and distribution, the arterial, venous and nerve supply to and from these various structures, and the pathways of vision from the retina to the brain cortex and back again.

In a case of neuro-retinitis, or retro-bulbar neuritis, one can-

not safely correct the disease process without correcting the causes as they exist in the body; this takes the oculist at once into the domain of the internist. Many ocular diseases are the local expression of blood disorders—something in the blood stream which finds in the delicate capillary system of the retina and chorioid a suitable nidus for setting up a disease process, such as malaria, pernicious anæmia, etc. This at once renders the oculist to some extent a hematologist.

A disease process set up in any important organ of the body will at least cast a reflection in the eye, where the delicate capillary membranes—the iris, retina and chorioid—are visible to the observer as in no other tissue in the body. The oculist looks into the eye and diagnoses Bright's disease, uræmia in pregnant women, tuberculosis, cerebro-spinal meningitis, brain tumor and abscess, diabetes, etc. In searching for the signs of these ailments in other parts of the body, one has a right to know the cause of the ocular disease, and should let no case of retinal exudation, hæmorrhage, optic neuritis or motor paralysis go unexplained. Atrophies of the optic nerves dependent on general nervous degeneration or degeneration of certain tracts of the spinal cord, and neuritis dependent on toxic conditions, etc., are diseases which properly belong to the neurologist, but they often first come to the oculist because the symptoms are first noticed in the eyes, and he should be familiar with the systemic expression of these diseases, in order that he may find corroborative evidence to substantiate his diagnosis.

It becomes also, nowadays, a matter of necessity that the oculist should be a laboratory man, and have a good understanding of germs and germ life as well as a familiar knowledge of the histology of ocular structures and the behavior of the ocular tissues when affected in the various stages of disease and inflammation.

Embryologically considered, the eye is an outgrowth of the brain, and after fully developed retains a more or less direct connection with the cerebrum through the second, third, fourth, fifth, sixth and seventh nerves, and with the spinal cord through the cervical nerves. The nerves furnishing impulses of sight, feeling, motion, secretion and nutrition to the various ocular structures are so intimately connected by intercommunicating fibres in the brain, and by the association of various nerve ganglia inside and outside the skull, such as in the ear, nose, face, scalp, neck and throat, that it is impossible to consider one without considering

the other. How, therefore, can one successfully practice ophthalmology and never look into the nose, or consider the ear, the throat, the blood; disclaim any knowledge of physical diagnosis and boast of ignorance of everything but the organ of vision alone? Only after requiring a student to qualify by years of study in general medicine, or by a year of experience as interne in a general hospital, and then a sufficient service in an ophthalmic institution, should he be permitted to appear before an examining board, when, if found competent, he may be permitted and licensed to practice ophthalmology.

But the speaker drew a sharp line between the study of ophthalmology and its practice, which latter should include the various and therapeutical measures directed toward the cure of the abnormal ocular condition. All system diseases should be referred to the general practitioner or proper specialist at once. Whether the oculist has a right to practice other specialties, such as nose, throat and ear, each man must decide for himself. The field of practice is changing to include the nose, whether we would have it or not. The connection between the eye and ear is not so intimate, and yet there are optic symptoms of otitic disease, such as: palsy, strabismus, nystagmus, lagophthalmos, optic neuritis, neuro-retinitis, etc. Between the throat and eye there are but few instances of connection, e. g. adenoids and phlyctenulæ, and catarrhal conjunctivitis. The plea of the essay was for a wider field of study for the oculist, which carries with it somewhat wider limitations of ophthalmic practice.

The Mind of the Patient.

Dr. Sam C. Norris, of Anderson, Indiana, in a paper on "The Mind of the Patient," said that the question of mental influence, he assumed, was no longer open to debate within the profession, and his plea is for a greater consideration, on the part of the profession, of the mental factor that is in operation in some degree in practically every case seeking the physician's aid, and for a more rational and scientific effort to administer to its shortcomings. For convenience he groups cases as (first) of either functional or organic disease combined with a normally acting mental factor, and (second) cases with or without either functional or organic disease, combined with an abnormally acting mental factor. Cases of the first class afford little opportunity for the skill of the psycho-therapist, because the action of the normal mental factor is always in the right direction; but the cases of the second

class constitute the larger number of those seeking relief. He subdivides these into (a) cases evidencing undoubted symptoms of disease, functional or organic, combined with more or less perverted action of the mental factor; (b) cases evidencing only a modicum of disease, combined with a mental factor, the faulty action of which is so exaggerated that it predominates the whole case; (c) cases yielding absolutely no evidence of either organic or functional disease, but coupled to an abnormally acting mental factor that conceives and elaborates complete clinical pictures ranging from comparatively simple insignificant ailments to complex complications that apparently exceed the bounds of possibility. The author's observation has led him to the conclusion that only a small minority of all physicians give any systematic recognition of this all powerful mental factor as affecting either their diagnosis or their treatment; and the larger number of this small minority do so in a haphazard manner or wholly unconsciously, having been endowed by nature with the faculty of mental suggestion. In order to inaugurate rational therapeutic measures in any case, it is the author's opinion that it is necessary to determine with some degree of certainty which symptoms depend upon actual pathologic lesions and which upon the perverted action of the mental factor. While positive that the most powerful suggestion, even under ideal conditions, cannot effect the slightest change in the essential life history of a single cell, he is just as positive that the essential physiological reactions of the most potent drugs are incapable, of themselves, of effecting the slightest change in either the degree or character of the reaction of the mental factor. The reaction of the mental factor is amenable only to suggestion. It must always be borne in mind that, so far as the patient is concerned, the one set of symptoms is just as important, just as real and causes just as much pain and anxiety as the other. Had the mental factor in disease always received due consideration, study and tending there would have been no occasion or necessity for the sects, sciences and church movements which usurp the prerogatives, duties, honors and emoluments that theoretically, logically, legitimately and practically belong to the medical profession. The paper is a plea for the general recognition and practical application of the principles of psycho-therapy.

Discussion. Dr. J. A. Stucky, of Lexington, Ky., said that in the relation of the mind to the body it is evident that like begets like, and if a man is confident he has the skill and knowledge to perform an operation, he begets the same belief

and confidence in the patient. He mentioned psychic hemorrhages, and said that any who had undertaken to do a mastoid operation under local anesthesia knew the value of talk. The speaker thought there should be in every medical university and college a chair of psychological medicine, where this and kindred subjects are thoroughly taught.

Dr. Critendorf, of Ithaca, N. Y., said that in the case of insane patients, with whom his work had largely associated him—and not all insane patients are in hospitals—it is impossible to impress them, useless to argue with them, and he had ceased to try.

Dr. Davidson said that in operating for benign growths in the larynx, for instance, where one must use local anesthesia, in order to keep the patient quiet, it is all important that the physician's suggestion be in this line.

Dr. F. Park Lewis, of Buffalo, said that sometimes in the persistent asthenopias refraction fails and the best efforts that can be employed result in no benefit. He cited a case in his own practice, wherein the patient, after long years of suffering, had been led through his own readings to try auto-suggestion, and had been absolutely relieved by this method, there being no pathologic condition that would prevent the eyes being better.

Dr. Leartus Connor, of Detroit, said that as a class of educated men the medical profession had certainly neglected one of the most important factors in life, disease and the remedies for the latter. Many fail through ignorance of the power and the ability to use the power of the mind.

Dr. Louchery, of West Virginia, said that the great difficulty was that, in their college days, students are not taught sufficient mental philosophy and psychology. There is a field for specialists in this line and some of the younger men must build up in that direction.

Dr. Gibson, of Young-town, said that a savage dog you are not afraid of will run away from you. It is this unconscious therapeutics that is indicated by the personality of the physician. Confidence in yourself will bring confidence from the patient.

Dr. Percy Friedenbergh, of New York, said that while not wishing to bring a discordant note in the chorus of praise, he would call attention to the fact that for thousands of years the practice of medicine was a branch of philosophy, a branch of psychic science, and asked the hearers to compare the advance made in the science of medicine in those years with its advance

in the past hundred years under the simple matter-of-fact methods of natural science. The physician's personality, surroundings, etc., can all be summed up under common sense. An architect must know how to build a house, and a lawyer must know the law, and a physician must have his technique at the end of his fingers to accomplish his results, no matter how the patient may feel toward him.

Dr. Robinson, of Colorado Springs, agreed with the preceding speaker, and said that one must not think he could go home and by positive statements cure his patients. He must make no statements that are not true, or he will find they fail of their purpose.

Dr. Norris, closing the discussion, said that the plea he wished to make was that there is a scientific side to this not appreciated by the majority of physicians. Psycho-therapeutics requires something more than the Svengali look and mere confident assertion.

The Sphenoidal Sinus as a Possible Etiological Factor in the Production of Retrobulbar Neuritis from an Anatomical Basis.

A paper on "The Sphenoidal Sinus as a Possible Etiological Factor in the Production of Retrobulbar Neuritis from an Anatomical Basis," by Drs. L. M. Francis and James A. Gibson, of Buffalo, was read by the former. The design of the paper was not to go into the clinical aspects of disease of the sphenoidal sinus in relation to optic nerve inflammation, but rather to set forth certain facts concerning the anatomical relations of the optic nerve and commissure to the sphenoidal sinus and orbit, based upon results of observations made upon specimens, thus demonstrating the intimate relation existing between them. Points of special interest are: First, how much protection has the optic nerve and the commissure from the sphenoidal sinus? second, diverticula extending toward the orbit; third, observations concerning the blood supply. In the specimens shown great variation in location, size, extent and thickness of wall of the sphenoidal sinus is noted. In 33½ per cent the nerve was separated from the cavity by a bony wall of less than .25 mm.; in 30 per cent by less than .5 mm.; in 3 per cent by .2 mm. In 17 per cent diverticula approaching or invading the orbital wall were found. If the findings on these specimens are reasonably fair, being taken at random without regard to clinical history or cause of death, and

may be regarded as a normal index, it follows that one-third of the optic nerves and commissures are shielded from the sphenoidal sinus by a thin, paper-like bony wall measuring a quarter of a millimeter or less in thickness. It is difficult to conceive how an inflammatory process could go on in a sinus of this type without causing functional impairment if not serious damage to its neighboring optic nerve or chiasm. If conclusions regarding the blood supply of the sinus are sound it is easy to comprehend the avenue by which infection might travel. It would seem from the data furnished by a study of these specimens that they emphasize the importance of serious consideration of possible sphenoidal disease as well as affections of the other accessory nasal sinuses in all retrobulbar inflammations of the optic nerve, the origin of which is not definitely accounted for by other distinct causes.

Discussion.—Dr. Oscar Dodd, of Chicago, said that some cases he had had were undoubtedly due to involvement of the sphenoidal sinus, and he had been surprised in every case where there was severe inflammation that he did not get earlier trouble with the optic nerve. In one case which came to autopsy the history, later obtained, showed that the trouble had been going on for three years, without optic symptoms until meningitis occurred.

Dr. Stucky asked if there was any observation as to the variation in size of the sinus in these optic nerve disturbances as regards the right and the left side.

Dr. Friedenberg said that one reason this is not seen more frequently clinically is that there are such wide variations in anatomical relations, and, too, the diminution of vision does not come on until late and is mainly in the color field.

Dr. Casey Wood, of Chicago, said a paper of this sort was a demonstration of the justification of a society of this kind, as it showed the connecting line between the ophthalmologist and the laryngologist. He sympathized in the work so well done by Drs. Francis and Gibson from the fact that many years ago he had spent months in a laboratory investigating neighboring sinuses, feeling at that time there was something more than contiguity.

Dr. Joseph Beck, of Chicago, said that not only must the thickness of the sinus wall be considered, but the etiologic factor and the kind of infection. Retrobulbar neuritis has taken place in a very thin-walled sinus, simply because there was a very virulent process.

Dr. Hollinger, of Chicago, asked if there was any definite

data of practical value that would lead one to determine in a given case if there be a thick wall or a thin wall. One of the specimens shown had a thick wall on one side and a thin wall on the other.

Dr. Andrews, of Chicago, said in his investigations he had found a large frontal sinus with a small sphenoidal cavity, and vice versa. He had also failed to find any relation between the size and shape of the antrum of Highmore. It is his impression that there is little relation between eye trouble and the anatomical arrangement of the sphenoidal cavity.

Dr. Edward Jackson, of Denver, said it was worthy of careful bearing in mind and putting forward as probably true and worthy further investigating that the central scotoma which is so generally associated with retrobulbar neuritis, not clearly due to other troubles, is probable due to sphenoidal disease, whether other symptoms are present or recognized or not.

Dr. Francis, closing, said he thought this investigation was of practical value if it did no more than call attention to these things, as nothing is said about them in the recent text books.

Dr. Gibson said there was no guide as to whether the sinus be large or small.

Pseudo-Optic Neuritis.

"Pseudo-Optic Neuritis" was described by Dr. Theo. B. Schneideman, of Philadelphia, who spoke of the rarity of the condition and the scant reference to it in literature. DeWecker, Galezowski, Harlan, Dobrowolsky, Bristowe, Landolt, Donders, Loring, Marcus Gunn, Spicer, Nottbeck, Burkholder, Faith and Kinigsberg have called attention to the condition, by which is meant not simply the slight blurring and somewhat veiled appearance of the disc, which are quite common, especially in uncorrected hypermetropia and astigmatism, but a much more marked anomaly, consisting of a decided prominence of the papilla, the outlines of which are very indistinct or even obliterated so that the raised surface shades imperceptibly into the adjacent fundus; the color is heightened, the vessels are somewhat tortuous, in these respects the appearance hardly differing from true inflammation. The swelling is considered to be due to exudate, but there are of course no hemorrhages. Subjective symptoms are entirely absent, both visual and cerebral. Central vision is unimpaired and the fields show no contraction for form or color. The condition is congenital and has not been found to change during observation extending over years. The writer has had the opportunity of

observing two typical cases in sisters, covering in one a period of thirteen years and in the other a period of nine years. It is suggestive that in one of these cases the refraction was hypermetropic and the other myopic, tending to show that it is independent of the refraction.

In the discussion Dr. Derrick T. Vail, of Cincinnati, said he had observed such cases, and he thought it a great mistake to frighten these patients by a diagnosis of optic neuritis, confining them to a dark room for a number of weeks, and thus bringing on neurasthenia.

Dr. Wood referred to some beautiful drawings of this condition made by Beard, of Chicago, and reproduced in the *OPHTHALMIC RECORD* about seven years ago.

Dr. Jackson said that within a month he had seen a case wherein the condition remained practically the same that it was when examined nine years ago. He thinks when it is uncomplicated it is possible to recognize it at the first thorough examination. Perhaps the greatest difficulty in making the differential diagnosis would be between this condition and the hypermetropic neuritis or the neuritis due to eye strain rather than the choked disc of cerebral disease. The thing that had made him hopeful in his case was that, while the vessels were enlarged, there was no disproportion between the arteries and veins, the hyperemia being both arterial and venous.

Dr. Reber, of Philadelphia, had recently to deal with such a case, a young woman in perfect health, whose sister had three years before consulted him, with the same anomaly.

Dr. Gradle, of Chicago, said he had had a single case of pseudo optic neuritis complicated with true neuritis, in a woman of syphilitic history. Under specific treatment her vision had been entirely restored, but the picture did not change.

Dr. Friedenbergl said he thought a great deal of the apparent magnification of the disc and the vessels must be due to the fact that they are being looked at through a magnifying glass, in examining the fundus in cases of astigmatism, etc.

Dr. Schneideman said that in examining children and the insane, where the functional testing cannot be made, there is danger of making the opposite mistake of thinking the neuritis spurious when it is real.

Concerning the Etiology of Chorioiditis.

Mr. J. B. Lawford, of London, England, a guest of the Academy, read an address "Concerning the Etiology of Cho-

roiditis." He referred to the fact that syphilis was long considered the sole origin of chorioiditis, and that in the ninth decade of the last century doubt began to be expressed as to the sufficiency of the prevalent belief. Evidence in favor of broader and more inclusive views began to accumulate. He plead for a more thorough inquiry into the origin of disease of the chorioid, especially where its dependence upon syphilis cannot be clearly proved. He thought it would, indeed, be strange if a structure like the chorioid, exhibiting, as it does, a marked susceptibility to the syphilitic virus, should possess even the semblance of immunity to the activities of all other diseases of an infective nature. There are good reasons for accepting the view that all forms of chorioiditis (excluding the traumatic variety and that caused by extension of inflammation from adjoining tissues) are due to infection reaching the chorioid in the blood stream.

The evidence which has been accumulating during the last few years goes far to show that chorioiditis of varying type, both diffuse and circumscribed, may result from tubercular infection. Knowledge of tubercular chorioiditis is at present very imperfect, but the means for the detection of tubercle in man are now so easily available and becoming so reliable that the diagnosis of this form of chorioiditis may ere long become more certain than that of any other forms of the disease of this structure.

Enteric fever, malaria, several of the exanthems, influenza, systemic gonorrhoeal infection, many of the anemias, gout, all have been shown to be at times associated with chorioiditis. Of these, excepting influenza and enteric fever, there is but scanty information in this regard. Allusion is made to the possible connection between certain occupations and the occurrence of chorioiditis (worker in naphthalin).

Certain toxic conditions as causes of chorioiditis are referred to, chiefly those resulting from the ingestion of poisons of the ptomaine group and from varieties of auto-intoxication, e. g., boils, abscesses, pyorrhoea alveolaris and other purulent foci, or they may originate in faulty metabolism in the individual. The products of intestinal putrefaction are important factors in the causation of inflammatory changes in distant tissues, among which the chorioid must be reckoned.

The association of chorioiditis with disease of other important internal organs (liver and kidneys) has been noted and recorded, but the author does not think a causal relation has been established, although observations are on record which show the asso-

ciation is more than accidental. It is difficult to determine whether disease of the organ affected and the chorioiditis are to be considered cause and effect or as owning a common origin. Where there are chorioidal lesions in cases of chronic nephritis, it is probably more correct to say that the morbid condition in the kidney and chorioid are both secondary to vascular degeneration.

The Ophthalmic Origin of Otic Disturbances with the Cerebellar Control of the Eyes.

The purpose of a paper by Dr. F. Park Lewis, of Buffalo, on "The Ophthalmic Origin of Otic Disturbances with the Cerebellar Control of the Eyes" was, first, to call attention to the fact that clinical evidence shows that such relationship exists between the eye and the ear that an irritation or improper functioning in the former may be manifested in some disturbance of the latter; second, to show anatomically what these relationships are; third, to show that a complexus of symptoms closely resembling those of Meniere's disease may be produced through inco-ordinate action of the eyes, and, fourth, to show that in the physiology of vision the cerebellum exercises governing function. A case was cited as an illustration, of annoying fluttering and tinnitus which was intensified by close and continued use of the eyes, and was relieved by an application of suitable glasses. In a study of the literature on the subject it was found that in 1881 Stevens had noted the same phenomena, and in 1895 Dr. A. Foyer reported ten cases in a paper entitled "The Relative Importance of Labyrinthine and Ocular Defects in the Etiology of Vertigo." In 1901 the whole subject was completely studied by Rollet, of Blois. The writer added to these observations and cited cases in corroboration of his views. He then compared the symptoms known to be produced by eye strain with those observed in cerebellar neoplasm. It was evident that the same tissues were involved. Especial emphasis was put on that form of ataxia manifested by weakness of the legs which is not uncommon in a lesser degree in eye strain, and which almost invariably points to cerebellar tumor. The anatomical reasons for this were shown in the relation in the fetus of the cerebellum with the nuclei of the acoustic and motor nerves through the superior vein and by means of the longitudinal fasciculus. After pointing out the possibility of the eyes producing a complexus of symptoms closely resembling those of the Meniere's triad, he urged that when cases of this character present, in the interest of scientific precision,

the refraction and muscular values should form a part of the case record in every such instance. He believes that in the physiology of vision the cerebellum exercises a controlling influence, not only in maintaining our position in space, but also in co-ordinating the movements of the eyes.

Discussion.—Dr. Hollinger, of Chicago, maintained that a normal vertigo is present in every one, as instanced in looking down from a high building.

Dr. Friedenbergl said that he could produce the fluttering voluntarily, and thought it might be produced in this case by the effort of accommodation, and it might have been purely a motor overflow. Vertigo is not one symptom, but there is a long range of symptoms grouped under this term. In perforation of the drum the syringing of the ear may cause intense vertigo when it is quite evident there is no visual disturbance. When there is a disturbance of equilibrium there is an attempt on the part of the eyes to keep objects fixed in space which we know to be so fixed.

Dr. Barek, of St. Louis, told of a case where he was operating and whenever he accidentally or otherwise touched the granulations in the semi-circular canal a horizontal nystagmus was produced, in both eyes, but more pronounced on the affected side.

Dr. Beck, of Chicago, said he believed the symptoms of nystagmus and dizziness were of aural rather than ocular origin.

Dr. Gifford, of Omaha, cited a case in support of Dr. Lewis' contention, and added that the tinnitus mentioned by Dr. Friedenbergl on closing the eyes tightly he had attributed to the action of the stapedius muscle and considered it an overflow from the facial.

Dr. W. L. Dayton, of Lincoln, Neb., related three cases of dizziness, two of which had been relieved or cured by proper refraction, while the third was only relieved by irrigation of the middle ear.

Dr. Lewis, in closing the discussion, said he had not meant to claim more for his statements than they justly carried, and that while Meniere's is not a disease which begins in the eyes, there are a number of symptoms so like those of this disease that it is necessary to examine the eyes when these symptoms are found.

The Teaching of Ocular Pathology to Graduates and Under-Graduates in Medicine."

In a *Symposium on Ophthalmic Pedagogy*, Dr. Casey A. Wood, of Chicago, opened with a paper on "The Teaching of

Ocular Pathology to Graduates and Under-Graduates in Medicine." He said a knowledge of the elements of pathology of the eye is necessary to under-graduate students, and now, with the addition of a year or two to the collegiate course, it is possible for the student to devote some time to this special study. He described how this teaching was arranged in the college with which he is connected. He regards the instruction received by the under-graduate in the laboratory as most important. With post graduate students the instruction meted out should vary with the individual needs. It is insisted upon that an earnest investigation of the elements of ocular physiology, anatomy and pathology should precede or at least run parallel with the clinical study of ophthalmology. He advocated a course of post graduate teaching in the under-graduate schools, elevating the standard of instruction particularly in ophthalmology, which would soon make it unnecessary as well as undesirable for American students to go abroad, as they now do, for any considerable portion of their instruction in matters pertaining to diseases of the eye.

Ophthalmology for Students of General Practice.

Dr. Leartus Connor, of Detroit, followed in the symposium with a paper on "Ophthalmology for Students of General Practice." He was of the strong conviction that were all college courses free from chaff and full of good wheat, there would be plenty of time and energy for a general practice of ophthalmology adequate to enable the family physician to treat cases neglected or now in the hands of the opticians. The family physician does team work: side by side with ophthalmology are dermatology, obstetrics, gynecology, laryngology and other classes of practice—all limited and all helpful to each other. In remote districts the family physician must have an ability to care for minor eye troubles, and an obligation to place major ones in the hands of an ophthalmologist. The writer groups the following subjects he would place in general practice ophthalmology: (1) It would *not* include operations within the eyeball or on eye muscles, muscular imbalance or complicated cases of refraction. (2) Students should be qualified to treat injuries of the eye (not foreign bodies in eyeball), simple infections of the eye, diseases of the uveal tract and simple presbyopia, simple myopia and simple hyperopia. (3) To make intelligent inspection of the eye. (4) He would practice students in simple refraction. The author thought the various state organizations must be enlisted in the education of family physicians for first care for all disabled.

The Teaching Regarding the Effects, Diagnosis and Correction of Errors of Refraction.

Dr. Edward Jackson, of Denver, spoke on "The Teaching Regarding the Effects, Diagnosis and Correction of Errors of Refraction." He said that there is only a certain line of instruction with regard to refraction that can profitably be given to all under-graduates of medical schools under the limitations of the present medical curriculum. The courses of anatomy and physiology should give to every student a good general knowledge of the refraction of the eye and the use of the ophthalmoscope. A certain knowledge of mathematics and physics should be required of every student who undertakes to study refraction in preparation for ophthalmic practice. The measurement of the errors of refraction is a physical measurement to be learned by actually making such measurements, and for which laboratory training in physics is the best general preparation. Through all the teaching it is of the highest importance to help the student to clear geometrical conceptions and to this end diagrams and models are to be freely used.

Dr. Schneideman, who opened the discussion, said that students might be divided into two classes: those whose preliminary education included mathematical training, and those without this training. Previous acquaintance with methods of mathematical reasoning will be of the greatest value in the study of physiological optics, as is mental training of all kinds. Direct personal supervision and instruction is of greatest importance. There is no reason why any man of common sense who is fit to be a physician should not in time become competent to do this work. General practitioners should be capable of recognizing ophthalmia neonatorum and acute glaucoma. Almost everything else can wait for the ophthalmologist.

Dr. Grosvenor, of Chicago, told of the methods of teaching ophthalmology in Rush Medical College.

Dr. Baker, of Cleveland, said he had always insisted on students passing his examination in ophthalmology before they could secure their diploma in general medicine.

Dr. Valk, of New York, thought the use of the ophthalmoscope should be left entirely to specialists. He thought there would be difficulty in drawing the line if general practitioners were taught all the things advocated in the papers read.

Dr. Reber, of Philadelphia, said that in Temple University

all ophthalmic work had been cut out for the general practice students. While any man, student or layman, can be taught to see the optic nerve in half an hour, it will take him six months to learn to interpret what he sees. He felt the same held true in refraction and ocular pathology, and these should be left to the specialist. Students should be taught to recognize glaucoma from the examination of specimens.

Dr. Reeve thought it an anomaly of medical teaching that a young man presenting himself for a degree should be expected to detect a small nodule on the optic nerve, and yet should be unable to diagnose conjunctivitis. He would not require men to be experts in the use of the instruments, but they should know how to use the ophthalmoscope and distinguish hypermetropia, myopia, astigmatism and the commoner forms of eye disease such as can be inspected with the naked eye.

Dr. Alt, of St. Louis, said it was most important to teach the patient to *see* intelligently, and it was his practice to dwell more on this point than upon didactic teaching.

Dr. Barek, of St. Louis, thought the pendulum had swung to the other side, and whereas in former years too little instruction was given the student, at present he is burdened with too much.

Dr. McAllister asked for instruction as to reach those practitioners who have not knowledge enough to distinguish between those conditions that are dangerous and those which are not, in their early stages.

Dr. Byington, of Battle Creek, thought that the more the general practitioner knows of these things, the more he will be able to recognize the limitations of his practice and the more inclined to call for the specialist.

Dr. Wood, closing the discussion, said the reason Vienna is known as a medical center is on account of her post graduate teaching, and this might well be brought forward in our own schools.

Dr. Connor said that in many states laymen had secured the right to practice medicine, and if doctors can't do the work laymen are doing, or won't do it, they should stop kicking about it. Specialists should know how to take care of the disabled and sick, and leave nothing for laymen to do in this field.

Dr. Jackson held that it was just as important for the student preparing for general or family practice to learn ophthalmology as it is for him to learn surgery or any other work done by the general medical profession. A man is just as unprepared

for general practice who goes out unable to use the ophthalmoscope as he who goes out unable to use the stethoscope.

Causes and Treatment of Lachrymal Disease.

"Causes and Treatment of Lachrymal Disease" was the title of a paper by Dr. Charles S. Means, of Columbus. The speaker said that all writers agree that the nose is the chief offender in the causation of this disease. The nose, therefore, should be carefully inspected and the offending foci or pressure removed. Conservative treatment is always to be adopted and persisted in until either a cure is obtained or one is certain of its inability to effect a cure. The old fashioned probe and heroic treatment by strong antiseptics injected through the canal is to be thought of only as a last resort. Dr. Means described at length his method for removing the sac, learned at Fuch's clinic in Vienna. The following rules governing the operation were set forth: Never operate on acute dacryocystitis, nor until milder means have failed. Never operate during active syphilitic invasion. Extirpation of the sac is one of the most difficult of operations, and the field must be rendered as nearly aseptic as possible. General anaesthesia is not used except in children and extremely nervous individuals, as the hemorrhage is so much less under local anaesthesia. Six to eight per cent of sac removed will continue to have profuse lachrymation. Conjunctivitis or other irritation must be relieved and all strain, such as errors of refraction, corrected. The epiphora still persisting, the lower gland must, after several weeks, be removed. The removal of a section of this gland will usually cause atrophy of the upper gland and the epiphora will then cease. Occasionally the entire gland must be removed. The sac removal has an indirect action on the secretion of the lachrymal gland which causes the flow to cease. The eye does not become too dry without this flow of tears, as other secretions of the eye furnish abundant lubrication.

Dr. Barek, of St. Louis, said in removing the sac the greatest difficulty came from the upper portion of the sac, where the operator worked in the dark and where there was apt to be profuse hemorrhage. He had for some years followed a plan of operating in the opposite direction, thus overcoming this difficulty. After the sac is laid bare, he detaches it from the periosteum, then with a curved hook separates it from the nasal duct as far as possible, and cuts it off; then with strong forceps he draws the sac forcibly down and out. The upper part is thus clearly in

view, and on account of the strong stretching and pulling there is no hemorrhage from that part. The operation can be performed much more quickly as well.

Exophthalmic Goitre.

Dr. Albert Rufus Baker, of Cleveland, presented a table of statistics as to the clinical history of "Exophthalmic Goitre," covering fifty cases from his own observation, which he had compiled with the idea of seeing what became of the severe cases in which there was no question as to diagnosis. All these cases, which had been under observation on an average for nine years, had tachycardia, enlarged thyroid and very great exophthalmos. Forty-four are still living, three died under the surgeon's knife, one died from pneumonia after eleven years and another after twenty years, one in childbirth twelve years after the disease was first noted. None of them died of the disease or any complication *per se*. He is of the opinion that the natural tendency of the disease is to recover. The severest cases—those he had put to bed and been obliged to resort to canthoplasty—were the ones which recovered most completely and in the shortest time. The author has thought that part of the benefit claimed for thyroidectomy might be due to the enforced rest in bed.

While there is no specific treatment, much can be done for these patients. Rest, both mental and physical, during the acute stage, is most important. Hydrotherapy is of great service. Phosphate of soda has been prescribed as routine practice for twenty years. The faradic current has been found of benefit in reducing the exophthalmos. Strophanthus has served better than digitalis when dilatation of the heart is present. Special indications are met as they arise; iron for aemia, quinine and arsenic for indigestion and bichloride for intestinal antiseptis. Errors of refraction are fully corrected, marriage and childbirth are encouraged. No one can successfully treat exophthalmic goitre who is not more friend and counselor than he who alone wields the knife and prescribes pellets.

Dr. Vail asked what the essayist thought was the remote cause of the disease, behind the exciting cause of disappointment in love, overstudy for approaching examinations, etc., as noted in the tabulated report he presented. He referred to the inability to raise sheep in certain portions of Michigan until the source of the salt supply was changed, that which had been supplied having been entirely devoid of iodine. The question arises as to whether it is the lack of iodine salts in the physiological chemistry of the body

which was the predisposing cause, this remaining latent until the exciting cause came up.

Dr. Francis, of Buffalo, asked if papillitis had been noted associated with exophthalmic goitre. He had observed a case which could not be accounted for in any other way.

Dr. Baker answered the last question in the negative. He said there was a difference between exophthalmic goitre and other forms of goitre which are probably due to lack of the iodine salts.

The Operative Treatment of Persistent Glaucoma.

Dr. Percy Friedenbergs paper on "The Operative Treatment of Persistent Glaucoma" was a study of substitutes for iridectomy, cyclodialysis of Heine, sclerotomy (Lagrange) and other innovations. He said that the management of the various pathological forms of increased intra-ocular tension is one of the vital questions of ophthalmology, and in spite of the vast amount of pathological research, clinical observation and operative advance, it still remains an open one. A review of the literature shows it is still too early to form a definite judgment as to final results of either Heine's or Lagrange's operation. The favorable statistics of the latter procedure may be due, wholly or in part, to the iridectomy which accompanies it. The fact that Lagrange's operation includes iridectomy somewhat diminishes its usefulness, too, laying it open to the same objections that have been raised to the latter procedure. This is most obvious in cases where dangerous hæmorrhage is to be feared or has actually taken place in a previous operation, either on the affected eye or its fellow, in cases in which the iris is atrophic or adherent, and to a certain extent in extreme hypertension with shallow anterior chamber, where there is danger of wounding the lens, or where sudden diminution of tension is apt to be followed by intraocular hæmorrhage or by prolapse of iris or vitreous. The last objection is less grave, as the sclerotomy may be depended upon to diminish tension sufficiently to allow an iridectomy to be performed without injury to the eye. In cyclodialysis, too, it has been advised to perform iridectomy and thus get the undeniable benefit of the angle of the anterior chamber and trans-iridic drainage, plus whatever value the establishing of superchorioidal filtration may possess. The most evident objection to cyclodialysis is the difficulty of performing a clean operation without injuring the ciliary body. The danger of vitreous prolapse, of hæmorrhage and of detachment of Descemet's membrane must also be considered. To these

purely technical difficulties must be added the possible insufficiency of the filtration channel via the suprachoroidal space, and in any case the question of its permanency.

Increased Tension in Ocular Diseases of Infancy and Childhood.

Dr. John Edwin Brown, of Columbus, followed on the program with a paper on "Increased Tension in Ocular Diseases of Infancy and Childhood." He said that while there is no doubt that there may be a relation between intra-ocular pressure and the resistance of the supporting tissues of the eye in the very young as well as in the adult, it is much more easily recognized in the latter. In children the pressure may exist and yet not be manifested by the usual plus tension, owing to the elasticity of the coats of the infantile or juvenile eye; but this increase tension may prove disastrous to the integrity of vision and physicians should be alert for cases presenting such symptoms. The author cites cases which call attention to this condition, and states that increased tension may result in damage to the nerve without much effect on the ocular coats as in glaucoma of the adult; it may effect considerable change in these coats, the function of the nerve suffering very little, or, as is common where the disturbance is not arrested early in its course, both coats give way under pressure and the nerve is damaged and vision reduced to even blindness.

Disturbance of intra-ocular pressure may be an element in a number of diseases of the eye in infancy and childhood and may explain a less tractable course for some of these maladies. It may disappear without having wrought any permanent impairment to vision, but in other cases may do damage to this function or give rise to secondary changes that will in time produce blindness. In such ocular inflammations the usual local treatment may have to be influenced by this element of increased tension, eserine and dionin being agents that judiciously used will greatly aid in resolution of the disease. The element of high tension may call for the use of cold as an application where otherwise heat would be prescribed. In incipient but positive beginning hydrophthalmus, iridectomy should prove useful. It is doubtful whether this be of any advantage when the disease is advanced.

Dr. Jackson opened the joint discussion on the papers of Dr. Friedenbergh and Dr. Brown. He said he was favorably impressed with Herbert's original description of his operation to secure a

filtering scar in a cystoid scar and did it about twenty months ago. The case—one of secondary glaucoma—is still under observation and tension has remained normal. While he had not used La-grange's operation, he regards it is clean and simple. He thought the excision of sclera might be made larger, and if this does give a permeable scar, this might be serviceable in cases of glaucoma. In cyclodialysis he thought the chief risk would be in wounding the uveal coat and advocated the doing of a preliminary posterior sclerotomy.

Dr. Vail told of having observed one case in a girl of 16, who had chronic inflammatory recurrent glaucoma, wherein the cupping was the most pronounced he had ever seen. This case had gone on to destruction.

Dr. Greene, of Dayton, reported a case in a boy of 10 years, who had suddenly developed the acute inflammation. There was high tension and great cupping of the disc. The treatment had been an iridectomy under eserin.

Dr. Alt told of a case in a young girl of 11, who had been examined by a western oculist for glasses with cyclopegia, and the instillation of atropine had caused glaucoma in both eyes. Eserin relieved within two days.

Dr. Campbell, of Detroit, had seen recently a case of glaucoma in a child of less than ten months old greatly improved under myotics. He doubted the propriety of operative interference in so young a child.

Dr. Baker, of Cleveland, has under observation a girl of 11 years with chronic glaucoma, which he had at first diagnosed as congenital staphyloma, but there had never been acute symptoms.

Some Facts Concerning Family Exophoria.

Dr. Wendell Reber, of Philadelphia, presented "Some Facts Concerning Family Exophoria," his paper being a preliminary contribution to the study of the relation of cranial build and orbital formation to the status of the extrinsic ocular muscles. The writer said one of the most striking facts in ophthalmology is the persistent fashion in which nature in some families hands down from generation to generation a certain type of defective eye or eyes. Astigmatism will be passed on in degree and axis from parent to child. If so delicate a matter as corneal curves is shown in heredity, how much more likely is it to show forth in the balance or imbalance of the external ocular muscles. That such balance or imbalance is to a certain extent influenced by

cranial formation and orbital build is practically an accepted fact. It had occurred to the writer that the diagrams used by hatters might be profitably used, and he began sending members of families in which there were two or more exophorias to the hatter for a "conform," as it is called by those in the hat trade. These diagrams represent fairly well the antero-posterior and intraparietal transverse diameters of the skull. In thirty-four exophorias, twenty-one submitted to head measurements, and of these latter eighteen were long skulled and three medium skulled. If this proportion holds out in a large number of cases, it would indicate that doliocephalus (or long skulledness) predisposes to exophoria. The writer believes that muscle imbalance in all cases is the result of two factors: the anatomic build of the orbit and the innervational state of the muscles. While realizing that the facts submitted are tentative, the author believes that a further study along these lines will crystallize his belief into a certainty.

Dr. Valk, of New York, said he hoped the society would some day take up the question of heterophoria as to whether it was innervational or anatomical.

Dr. Lucien Howe, of Buffalo, said he thought the facts presented by the essayist were of great value and should be followed up.

Dr. Schneideman thought the work done by Dr. Reber might throw some light on the controversy raised in regard to Stilling's hypothesis regarding the shape of the skull in myopia, and referred to the work done by Ask of Scandinavia.

Dr. Reeber, in closing the discussion, said that after he had gone over the 1,200 skulls in the Academy of Sciences in Philadelphia, he would have something to say about crania that have been deprived of their covering, but at this time he wished only to refer to the living subject.

Metastatic Carcinoma of the Chorioid."

"Metastatic Carcinoma of the Chorioid," by George F. Suker and Lorenzo N. Grosvenor, both of Chicago, was a critical review of reported cases, with a case report and specimen. The salient conclusions drawn from the study of the sixty-two cases of metastatic chorioidal carcinoma are as follows:—

It does not occur before the age of puberty nor directly thereafter, but usually between the ages of 30 and 60. There is the invariable presence of a carcinoma in some other organ. There is a great tendency to bilaterality: exceedingly rapid loss of vision, and there is a uniformity in the lodgment of the embolus in the

ciliary arteries and in the character of its growth. The duration of life after its appearance in the eye is very short (an average of seven months). Its growth along paths of least resistance is rapid; it rarely perforates the globe and there is a rarity of epibular tumors. The papilla is practically immune for its first appearance. There is extensive detachment of the retina. There is minus tension in a large percentage of cases. A tendency towards the three types of carcinoma in the same individual tumor—the scirrhous, medullary and adenomatous—is noted. There is a proneness to indirect involvement of the blood vessels. The tumor cells rarely invade the retina and disc, either by extension or tertiary metastasis. There is a seeming regularity with which the tumor encircles the disc. There are numerous areas of necrosis and hemorrhage. Duration of life is extremely short after chorioidal involvement. The characteristics, in general, are directly opposite to those of sarcoma.

Epidemic of *Pneumococcus* Conjunctivitis.

Dr. Adolph Alt, of St. Louis, read a paper relating his experience in an "Epidemic of *Pneumococcus* Conjunctivitis" observed in St. Louis during the months of January to July, 1908. He dwelt particularly on the variety of clinical symptoms produced by one and the same infection, by which it is plainly shown that no really definite diagnosis as to the infectious agent can be made without microscopical examination or culturing. He recommended as an excellent staining material for the examination of conjunctival secretions before treating the cases the azur II of the Giemsa stain for *treponema pallidum*.

In the discussion Dr. Wood asked if there had been any complication in the corneal tissue.

Dr. Jackson said he had recently had much the same experience as reported by the essayist, where no infecting organism other than the pneumococcus had been discovered.

Dr. Alt, answering Dr. Wood's inquiry, said that in one case the conjunctivitis had been followed by pus in the cornea. In one case some phlyctenules had appeared, and in one there was an ulceration of the margin of the cornea. In another case there was an ulceration in the nasal canthus. In one case there was a trachoma, which was not influenced by this disease.

Post Operative Sympathetic Ophthalmitis.

"Post Operative Sympathetic Ophthalmitis" was the subject of a paper by Dr. Don M. Campbell, of Detroit. The essayist said

that the theory which best explains the existence of this disease is one of infection followed by general systemic invasion—the latter condition being the exciting cause of the inflammation in the secondarily affected eye. This theory seems to be borne out by the special form of pathologic change found in the exciting eye, which has the characteristic of an indogenous infection and is anatomically characterized by dense infiltrations in the uveal tract and not by exudates on the internal surface of the eyeball. While the special micro-organism has not been demonstrated, it is clear that it is not one of the pus-producing germs. Also it is a fact in the author's observations that the patients are sick; they are badly depressed, have elevation of temperature and pulse acceleration, and all have great pain in the exciting eye. All had the peculiar symptom of pricking of the cutaneous distribution of the ophthalmic division of the fifth nerve. The speaker thought an early leucocytosis could be found in impending cases. The result of treatment in accordance with modern ideas also offers confirmation a priori of this theory of infection. Experimentation with blood counts before and after the exhibition of sodium salicylate revealed the fact that an immediate and constant result was found to be raising the number of white blood corpuscles. It produces a medicinal leucocytosis. The writer thought some progress can be made in the early diagnosis of impending outbreak in the fellow eye by a study of wounded eyes by means of transillumination, in this way detecting the influence of the greatly infiltrated uveal tract on the shadows.

In the discussion of this paper Dr. Schneideman and Dr. Young, of Burlington, each reported several cases of post operative sympathetic ophthalmia. Dr. Alt called attention to a recent translation from the French in the *OPHTHALMIC JOURNAL* in which injections of corrosive sublimate were mentioned in this condition. Dr. Reber recited a case following cataract extraction, which in spite of inunctions of pilocarpine, sweats, iodine, prayers and everything else, developed papillitis.

Dr. Jackson said that it was generally found that the cases that arose *after* the enucleation of the exciting eye almost invariably recovered.

Refractive Myopia.

"Refractive Myopia." by Dr. Francis Valk, of New York. The author asks the question, "Have we a refractive myopia, and if so, what are the essential points in the diagnosis, and what are

the advantages of this to the profession?" From a careful study he is convinced that there is a refractive myopia, the essential point in the diagnosis of which rests alone in the corneal curve, which must be much smaller in the radius of curvature of the anterior surface in each meridian, and that this refraction may be increased by the curve of the posterior surface. As shown by Tschering, the radius of curvature of the posterior surface is very much less than that of the anterior surface. These two surfaces must have a decided bending of the rays of light as they enter and pass the dioptric media. This must advance the posterior focal point to a position in front of the retina, which may be corrected by a concave glass that will afford a permanent state of vision and consequently there will be no tendency to progression with all its attendant dangers. The radius of 7.65 mm. as normal is adopted as the result of more than a thousand measurements of the meridians of the cornea, and it illustrates and confirms all the author's conclusions. He thinks the advantages of this diagnosis are important, in as much as all are familiar with the dangers of pernicious myopia, the occurrence of progression to an extreme degree, the possibility of a detachment of the retina, the formation of an extensive posterior staphyloma with its attendant sclero-chorioiditis, the diminished vision and inability to use the eyes. A myopia of curvature seldom if ever progresses: it does not tend to the formation of the posterior crescent or ectasia, and even an intercurrent chorioiditis does not tend to increase, while the vision remains stationary and there is excellent ability to use the eyes, with possible absence of presbyopia as age advances. The writer states he has never seen a true case of refractive myopia increase to any appreciable extent.

Discussion. Dr. Jackson said that in his observation of his cases he had seen a small number of cases of myopia in which the cornea shows more than the normal curve. He thought not more than 5 per cent of cases of refractive myopia are progressive, and that 5 per cent is wholly in young people between 10 and 15 years of age. He thought a myopia beginning as a myopia of curvature might, through over-use of the eye go on and add an axial myopia to that of curvature. He was not disposed to draw a sharp line between myopias, as innocent and progressive, but as rather the extremes of the one condition.

Dr. Lucien Howe said that it is not a matter of theory but of distinct demonstration that cases which have been considered as myopia are but an excessive action of the ciliary muscle.

Dr. Gradle stated that every case of myopia is progressive in the early years of life. He bases his prognosis on three criteria: First—The rate—whether still growing after puberty, or after 20 years of age, or later. Of course every recent increase increases the probability of further change in that eye. Second—The liability of progressiveness can be judged by the vision, the more favorable cases having normal vision with correction, while the unfavorable cases cannot be given perfect vision by means of the most accurate correction. Third—And most important, the condition of the fundus with reference to the sharp outlines of the optic disc. The more nearly normal, the less likely are changes, such as chorioiditis, opacities, etc. He thought it probable that some of the cases of myopia can be demonstrated by the ophthalmometer to be due to an unusually short radius of curvature.

Dr. Valk, in closing, said he hoped the paper would stimulate others to make investigation along this line. In his cases, where he had found the shortened radius he had never found any evidence of posterior chorioiditis, etc.

Two Cases of Parinaud's Conjunctivitis.

Dr. C. Barek, of St. Louis, reported "Two Cases of Parinaud's Conjunctivitis," a rare disease in the western part of the United States. He said there were three opinions regarding the etiology: Local tuberculosis; a constitutional disease, "*sui generis*," a zoonosis of obscure nature. The first view seems least tenable. The tubercle bacillus could never be demonstrated and the clinical picture differs materially from the well-known one of conjunctival tuberculosis. There were no ulcerations and in all cases a complete restitutio ad integr. without scar formation. Which of the other theories will prove correct must be decided by future investigation. The author inclines to the view of Parinaud, that it is an infectious disease, leaving it open whether it is an animal disease or not, for the entire picture is one of infection of the glands by way of the conjunctiva. In all instances the affection is reported to be one-sided. In character it is benign, as far as complications of the cornea are concerned. There is a tendency to self-limitation of the disease. While an elevation of temperature has not been reported by others, it existed in the author's two cases, and he believes it might have been found in other cases had it been sought. This also speaks for the infectious nature of the disease. Dr. Barek had in his cases removed the excrescences with scissors, and a number of the yellow infiltrates

were punctured and squeezed out with the trachoma forceps, the remainder being treated in the same manner after a few days, during which there was no reaction. The improvement was very rapid. After the surgical measures, daily applications of a 1 per cent solution of the sulphate of copper were made, while internally the patient was given arsenic and iron.

Discussing this paper, Dr. Alt said he had had occasion to examine histologically nodules excised from such conjunctivæ and was unable to stain any micro-organism. If any existed they were too small to show.

Oculist and Aurist, or Oculist and Physician—Which?

Dr. Lucien Howe, of Buffalo, read a paper entitled "Oculist and Aurist, or Oculist and Physician—Which?" He said that the greater part of the work of the ophthalmologist relates to errors of refraction and, therefore, to conditions of the ocular muscles. Anomalies of the ocular muscles are, in many cases, associated with symptoms which are called reflexes. These symptoms are often dependent upon abnormal conditions of the stomach, the kidneys, the blood supply or other factors which constitute what is called the general health. It is impossible to distinguish between cause and effect unless not only the condition of the eyes is known, but the nature of these factors as well. It is therefore necessary for the ophthalmologist to ascertain by chemical or microscopical tests, or otherwise, according to the best modern methods, the conditions of the stomach, kidneys, blood, etc. One who thus practices ophthalmology not only as a surgeon but as a physician as well has no opportunity to make a thorough study of any other distinct class of cases. In Europe ophthalmology and otology are seldom practiced together, and this is true as well in most Eastern cities in this country. The author thinks that ophthalmology has less to do with otology than with several other branches of medicine. If one thinks for a moment of the results of syphilis and gonorrhea, a practitioner might better be oculist and genito-urinary surgeon than oculist and aurist. He thought the existence of such a society as this is warranted only on the basis of sociability and professional fellowship—not by the identity of scientific interests.

Discussion.—Dr. Jackson said that from the point of view of making a livelihood, one must take a sufficiently broad portion of the work to be able to draw a clientele and establish a practice that will give him sufficient work and sufficient return from it. In small

communities one has not the same opportunities in this regard that he might have in large cities. He did not think there should be any attempt on the part of the society or the profession to limit the activities of any individual. However, he agreed with the other side of the question presented by Dr. Howe, that there is such an enormous amount of material and so much to learn that no one can become thoroughly efficient in all branches and keep abreast of the times.

Dr. Connor, of Detroit, said that he thought it probable that one passing Dr. Howe's office would see simply "Dr. Howe" on his sign. Anything else tacked on to a physician's sign he regarded as simply a tail. It is more dignified to be simply "physician," and if one does special work others are sure to know of it. Nothing is gained commercially or professionally, by adding anything more than simply "Doctor."

Dr. W. S. Bryant, of New York, emphasized the impossibility of mastering more than a small part of any one branch.

Dr. Gibson thought it best to get down to the matter in a business-like way, and divide the work under departments, as does the manufacturer and merchant of today.

Dr. Andrews of Chicago said that while it was a question for every man to decide for himself, the smaller the field the more thorough one could become in that field.

A New Method of Tendon Shortening.

Dr. H. H. Briggs, of Asheville, N. C., presented "A New Method of Tendon Shortening" and exhibited the instruments he had devised for this purpose. The method is applicable to any case where shortening of an ocular muscle is indicated. The principle involved is the looping of the tendon and maintaining of the shortening thus attained by means of a flattened ring of silver wire clamped over the loop until inflammatory adhesion takes place. After the usual preparation of sterilization and anæsthetization, a small opening is made in the conjunctiva on one side of the tendon, 2 to 4 mm. from its insertion, the distance from the insertion varying with the degree of shortening intended. An ordinary tendon hook is then passed beneath the tendon and held by an assistant. The clamp forceps holding the silver ring is held over the tendon with one hand and the special tendon hook passed down through the ring and substituted for the hook held by the assistant. The tendon with its overlying conjunctiva is drawn up through the ring to the desired degree and the jaws of the clamp

forceps forcibly approximated. The moderate edema of the tissues about the ring immediately covers it so that no irritation is felt from the presence of the foreign body. Within twenty-four hours the strangulated tissues within the ring become white and begin to atrophy and on removal of the ring, in five to eight days, should be excised. A scissors-cutting forceps with wedge-shaped blade above and flat blade below is used to divide each end of the ring, and the severed halves are removed with small tissue forceps. The advantages claimed for the operation are: Absolute security from slipping or retraction of tendon. Simplicity. Elimination of sutures. Short duration of time of operation. Less pain. Less amount of plastic inflammation during convalescence. Less scar and deformity. Better results.

Dr. Ray of Louisville asked the author if he could gauge the effect of this or tell how much tendon he was drawing into the ring.

Dr. Jackson asked if the tendon would stand the amount of pressure put on it, or would it cut through. He thought the operation important from its simplicity.

Dr. Briggs, closing, said the desired effect could be had by pulling the tendon as far as wished through the ring into the jaws of the forceps. The tendon's actual advance would be represented by twice the length of the loop pulled through. He had done twenty-three cases and never yet had enough pressure to cut the tendon nor so small amount as to allow the tendon to retract.

An Analytical Study of the Eye as an End Organ.

Dr. Jos. E. Willetts, of Pittsburg, presented "An Analytical Study of the Eye as an End Organ," not as affected by disease, but as a possible factor in disease through the constant multiple photography of irrelevant impressions in already exhausted centers, as in cerebro-psychasthenia. These impressions are received through the special senses of sight and hearing. Sound, as ordinarily conveyed is composite, and once sound becomes individualized it is either sought or repelled; but one cannot eliminate the irrelevant impressions of sight, which are constant and more menacing, for sight is never composite. That which is before the eye is delineated in detail and acted upon by the intelligence before the eye will leave it. Believing that a week of absolute rest in the incipient stages of psychasthenia would benefit the patients more than six months in a sanitarium after secondary changes have taken place, the author of the paper has recently substituted

for that last resort prescription "change of scene," the more logical one of *cessation of scene*. This is accomplished by keeping the patient under a mydriatic and confined in a specially prepared dark room with every ray of light excluded. Such favorable results have been obtained in this method, which is as yet still in experimental stage, that the author believes a closer relationship between the oculist and practitioner will in the future be found in the conduction of these cases.

Hereditary Blindness and Its Prevention.

"Hereditary Blindness and Its Prevention" was the title of an exhaustive study, from the standpoint of physician and that of sociologist, by Dr. Clarence Loeb, of St. Louis. The writer divided the subjects under two heads: "Is there such a thing as hereditary blindness; and what is the best method of combatting it?" He said that upon purely theoretic grounds, it cannot be denied that hereditary blindness is at least a possibility, for the eye, no less than other organs of the body, must be regarded as the resultant of long years of evolutionary progress. An example in point is found in the case of the blind fish of certain caves in Indiana and Kentucky, which are undoubtedly the result of many generations of inherited adaptation to environments. If, then, in nature, where the law of the survival of the fittest finds its widest application, there are forms of life proving the actuality of the inheritance of abnormal eyes, there can be no doubt that the same will obtain in a state of society or civilization, where the element of altruism enters. The blind child of rich parents is the object of all the care that wealth and love can bestow, and in the case of the poor, the doors of our eleemosynary institutions are opened for him. The end result is the same, in that an attempt is made to bring the child to adult life in spite of his ocular imperfections. If he marries a person with normal eyes, who shall say that the tainted state of the one will not have as great an influence on the eyes of their children as the normal state of the other? If both parents are blind, especially if the nature of the blindness is the same in both cases, it is reasonable to suppose that the children will be affected to a great degree by the combined ocular stigmata. The author thinks this not only theoretically possible but theoretically probable. With the idea of securing statistics bearing on this point he has sent a letter of inquiry to oculists and institutions for the blind in America and Europe, and from the replies received, and from literature on the subject, has compiled statistics which are presented with the paper. Most of the cases of

hereditary blindness reported have been those where only one parent was blind. The argument, therefore, should not be that where one parent has normal sight there is only one-half the chance for hereditary transmission, but rather, that inasmuch as the danger is so great where only one parent is blind, it must be still greater where both are affected. The percentage of affected children in both cases is about the same. Both forms of marriage should be weighed in the same balance, and the victim of hereditary blindness should be allowed to marry whom he chooses or prevented from marrying at all. While no man should be held responsible for the condition of his ancestor's eyes, if it can be shown that in the past a large percentage of children have been affected with the same ocular lesion as their parent, it seems inevitable to conclude that the past is the index of the future and that practically the same percentage will continue to obtain. This is so axiomatic that life insurance, one of the most exact of modern businesses, is based on it. Dr. Loeb feels that it is the duty of oculists to recommend that no person suffering from these forms of eye diseases which have been shown to be hereditary shall be allowed to marry; that persons coming from families tainted with the disease and showing a high percentage of indirect heredity, though they themselves have normal eyes, should be advised not to marry, and that persons having two children suffering from a disease whose collateral percentage is high should be warned of the danger to subsequent children, with the advice that they check the disease at that point. These recommendations rest on the assumption that the percentage of affected children is high, at least 33 $\frac{1}{3}$ per cent. The diseases the author has listed as being transmitted from one generation to another are albinism, aniridia and coloboma iridis, anophthalmus and microphthalmus, atrophía nervi optici, cataract, ectopia lentis, family degeneration of the cornea, glaucoma, megalophthalmus, nystagmus, ophthalmoplegia and ptosis, retinitis pigmentosa, and general diseases.

As attempts to better the condition of mankind have always been met by the opposition of those to be benefited (e. g. vaccination), it is no more than to be expected that a proposition to prevent people affected with hereditary blindness from marrying will be met by the same cry of "interference with the rights of men." The author recommends that this society put itself on record, in some formal manner, as opposing the marriage of persons so affected.

Discussion.—Dr. Lewis, of Buffalo, said that so strongly do the

authorities of the state institution for the blind at Batavia feel on this subject, that it is not considered wise to allow the male and female pupils to mingle in their social affairs, or work, or in any way become acquainted.

Dr. Howe believed legislative action looking to this end could be enforced along the same lines as the laws preventing the marriage of near kin.

Dr. Stueber reported three cases of blindness in one family under his observation, all, apparently, due to profound shock to the mother during pregnancy.

Dr. Young felt that nothing of the sort recommended could be effected in a free country like our own, other than to point out the way, as people would follow their own inclinations in spite of anything that might be said.

Dr. Connor cited the law of Indiana where no marriage license is granted without the sworn statement of the contracting parties that neither have syphilis nor gonorrhoea, and thought a law such as recommended could be enforced on the same lines.

A resolution to the effect that it is the sense of the Academy of Ophthalmology and Oto-Laryngology that definite legislation should be fostered in our several states, with a view to preventing the marriage of persons blind, whether both contracting parties be entirely blind or only one be entirely blind, was discussed pro and con. Drs. Alt and Young opposed any such action, on the ground that laws restricting marriage tended to increase the numbers of illegitimate children. An amendment to the effect that a committee of three be appointed by the chair to consider this resolution and report at the next annual meeting, was substituted, and Drs. Leartus Connor of Detroit, Lucien Howe of Buffalo, and H. B. Young of Burlington were named by the chairman to act in this capacity.

Election of Officers.

Officers of the American Academy of Ophthalmology and Oto-Laryngology for ensuing year elected were as follows:

For President—Dr. Otto J. Stein, of Chicago.

First Vice-President—Percy H. Friedenberg, of New York.

Second Vice-President—B. W. Greene, of Dayton, Ohio.

Third Vice-President—C. Barek, of St. Louis, Mo.

Secretary—Geo. F. Suker, of Chicago.

Treasurer—Secord H. Large, of Cleveland.

Councillors—J. W. Murphy, of Cincinnati; Casey A. Wood, of Chicago.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. W. Edward Hibbard, of Pasadena, Cal., has returned from an Eastern tour.

Dr. Theodore Werneke has qualified as privatdozent in ophthalmology in Odessa.

Dr. Adolph Barkan of San Francisco has removed his offices to the Butler building.

The Working Home for Blind Men and Women in Philadelphia received \$1,000 from the estate of the late Jane B. Shain.

Dr. Charles A. Oliver, of Philadelphia, has returned after a summer spent at his country place, Maushope, Oak Bluffs, Mass.

By the will of the late R. H. Wood of Sidmouth, England, the West of England Eye Infirmary, located at Exeter, receives \$5,000.

Dr. J. B. Lawford was the guest of the American Academy of Ophthalmology and Oto-Laryngology at the meeting in Cleveland, August 27-29.

Dr. Horace Miller died May 29, 1908, at his Rhode Island home. Dr. Miller was at one time president of the New England Ophthalmological Society.

Dr. Don A. Vanderhooft, who has been pursuing a post graduate course in Vienna, has returned to Rockford, Ill., where he is associated with Dr. Horace M. Starkey.

Dr. L. Webster Fox, of Philadelphia, passed through Chicago September 10 on his return trip from Colorado, where he has been spending the summer hunting and fishing.

At the fifty-ninth annual meeting of the Indiana State Medical Association, held in French Lick Springs in June, Dr. Frederick

C. Heath, of Indianapolis, was re-elected secretary, and Dr. Albert E. Bulson, of Fort Wayne, was elected treasurer.

At the Chicago meeting of the Section of Ophthalmology of the American Medical Association, the following officers were elected: Chairman, Dr. Alvin A. Hubbell, Buffalo; vice-chairman, Dr. Melville Black, Denver; secretary, Dr. Albert E. Bulson, Jr., Fort Wayne, and delegate, Dr. Thomas A. Woodruff, Chicago.

The RECORD wishes to correct an error in a news item which stated that the Illinois State School for the Deaf had been criticized by the investigating committee. Dr. Phillip F. Gillette writes that this institution was given a "clean bill of health." The school for the deaf is entirely separate from that for the blind.

At the fifty-first annual meeting of the Missouri State Medical Association, held in Springfield, Mo., in May, it was decided to organize a section on eye, ear and throat, and a committee was appointed for that purpose, consisting of Dr. Thompson, of Kansas City, Mo.; Dr. McLemore, Nevada, Mo., and Dr. McShelton, of Joplin.

Dr. C. A. Veasey, assistant professor of diseases of the eye in the Jefferson Medical College and ophthalmic surgeon to the Methodist Episcopal Hospital, Philadelphia, has resigned these positions to remove to Spokane, Wash., and enter into co-partnership with Drs. R. L. Thomson, A. H. Coe and Wilson Johnston in practice limited to diseases of the eye, ear, nose and throat.

Beginning with September of this year and running into October, Dr. G. C. Savage, of Nashville, Tenn., will teach a class in errors of refraction and muscle errors only. The same course will be repeated in April and a part of May every year. The fee for either the fall or the spring course will be \$50. Every applicant must possess a medical diploma. He must have studied diseases of the eye, before applying, for nothing pertaining to diseases will be included in the course, except the diseases of the ocular muscles. Certificates will be awarded only to those who pass satisfactory examinations. Application for membership in either class should be made at least a month in advance.

CHICAGO EYE CLINICS.

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THE OPHTHALMIC RECORD.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|--|---|--|---|------------------------------|
| 9 A.M. | Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Geo. F. Suker (P.-G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.-G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.-G.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | | A. G. Wipern (E. E. N. T.) | | A. G. Wipern (E. E. N. T.) | | A. G. Wipern (E. E. N. T.) |
| 1 P.M. | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) | | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E. E. N. T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) D. A. Payne (Ills. Med.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) Wm. H. Williams (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Rush) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivnen (N.W.U.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) H. W. Woodruff (Inf.) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) T. A. Woodruff (N.W.U.) J. B. Loring (P. & S.) D. A. Payne (Ills. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivnen (N.W.U.) Francis Lane (Rush) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) *Frank Allport (St. Luke's) *Frank Brawley (St. Luke's) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) *Paul Guilford (St. Luke's) *Cassey Wood (St. Luke's) T. A. Woodruff (St. Luke's) J. B. Loring (Inf.) D. A. Payne (Ills. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Clarence Heath (N.W.U.) Geo. T. Jordan (N.W.U.) Richard Tivnen (N.W.U.) Francis Lane (Rush) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) C. G. Darling (N.W.U.) Chas. P. Small (N.W.U.) Alex. P. Horwitz (N.W.U.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Cassey Wood (N.W.U.) *Oscar Dodd (Inf.) *Frank Allport (N.W.U.) | Geo. F. Suker (P.-G.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P.&S.) | H. H. Brown (Ills. Med.) | *J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | Hurton Hazeltine (County) | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.-G.) |
| 4 P.M. | W. F. Coleman (P.-G.) | C. W. Hawley (P.-G.) | G. F. Suker (P.-G.) | C. W. Hawley (P.-G.) | W. F. Coleman (P.-G.) | Brown Puscy (County) |

*Special operative eye clinics.

ABBREVIATIONS:

| | | | |
|--|--|---|--|
| C. C. S.: Chicago Clinical School, 819 W. Harrison Street. | County: Cook County Hospital, W. Harrison and Honore Streets. | Pol.: Chicago Polyclinic and Hospi- tal, 174 E. Chicago Avenue. | Rush: Rush Medical College, W. Harrison and Wood Streets. |
| E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington and Franklin Streets. | Ills. Med.: Illinois Medical College, 182 Washington Blvd. Inf.: Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets. | P.-G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. N. W. U.: Northwestern University, 2431 Dearborn Street. | St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII CHICAGO, OCTOBER, 1908 NO. 10, NEW SERIES

THE RELATION BETWEEN RETINAL HEMORRHAGES AND HIGH ARTERIAL PRESSURE.*

BY L. WEBSTER FOX, M. D.,

Professor of Ophthalmology, Medico Chirurgical College of Philadelphia; Ophthalmologist to the Medico Chirurgical Hospital and

WARREN C. BATROFF, M. D.,

Director of the Clinical Laboratories of the Medico Chirurgical College and Hospital.

Following the reasoning usually given that there is a degeneration of the vessel wall from an accompanying anemia or as a result of toxic influences, as chemical poisons or venoms introduced into the system, or autogenous metabolic products, the result of a faulty body chemistry, we have been led to believe that these are merely predisposing factors: whereas, the true or exciting cause of retinal hemorrhages (in a very large proportion of the cases) is a sudden transient or a persistent abnormal elevation of the arterial blood pressure.

Structures containing end arteries, as the eye, brain, or kidney, with their usual delicate capillary endings, are least capable of withstanding this type of a lateral strain imposed upon their walls. An examination of the literature upon the subject shows that attention has been briefly called to this phenomenon, as a cause of retinal hemorrhages, twenty-five years ago by Mackenzie and Watson, who studied these cases imperfectly with the sphygmograph; also, more recently, by E. W. Stevens,¹ and later by Melville Black, both of Denver.²

That this is an etiologic factor, we believe to be partially established by our researches in this particular field during the past three years. The studies of the blood pressure, blood and urine of one hundred cases was decided upon to be investigated with this end in view. The patients examined were those seen within the first forty-eight hours following the hemorrhage: the larger number, however, were observed within twelve hours of the onset. In all cases, the blood pressure was estimated with the Stanton modification of the Riva-Rocci Sphygmomanometer with a 9 cm. cuff. The estimations were made either in the sitting posture, with the arm

*Read at the meeting of the Colorado State Medical Society, Denver, September 9, 1908.

(1) Ophthalmology, January, 1906.

(2) The Journal A. M. A., July 18, 1908.

elevated to the level of the heart or in the supine position with it bearing the same relation to that organ. The systolic pressure only is recorded, as it represents the greatest pressure the vessels were called upon to withstand. A complete blood count and an analysis of the urine with particular reference to the presence of albumin, glucose or casts was made in each case. The necessary data in the history and physical examination were then considered in order to determine the predominant factors essential in making a general diagnosis, irrespective of the ocular condition.

The thought which was responsible for these investigations was therefore an effort to prove this new field of vascular study, namely: the systematic estimation of the arterial blood pressure, as having both an etiologic and therapeutic relation to hemorrhages of the conjunctiva and retina. The blood pressure should be carefully and immediately studied in this class of ophthalmic cases, first with a view to determining the presence of one of the most frequent causal conditions; secondly, to permit us to intelligently direct the treatment toward absorption of the existing clot and the prevention of further hemorrhages. It is thus by this timely interference that many years of vision and even life may be saved these individuals. They are often, as most of us know, quite robust and enjoying the best of health in so far as their knowledge goes and only in the latest stages, when tangible subjective symptoms appear, can they be persuaded to relinquish their activities and excesses. The oculist, therefore, often being the first physician to be consulted, should study these patients with the internist, in order that the most comprehensive knowledge possible should be available for the sufferer.

The tabulated results of the investigation of one hundred consecutive cases, derived from private and dispensary practice, are herewith subjoined: the number, although not large, we consider sufficient to illustrate our premises.

| Case | Age | Ocular Diagnosis | Blood Pressure | Ht. | R.B.C. | Blood W.B.C. | Urine | General Diagnosis |
|------|-----|--|-------------------|-----|-----------|-----------------|------------------------------------|-----------------------------------|
| 1 | 58 | Hemorrhagic Retinitis. | 158 Mm. | 70" | 1,100,000 | 7,200 | Albumin, No Trace, No Casts. | Arteriosclerosis. |
| 2 | 35 | Hemorrhagic Retinitis, Choked disc. | 210 Mm. | 80" | 3,960,000 | 7,000 | Albumin and Casts. | Chronic Parenchymatous Nephritis. |
| 3 | 46 | Anemia of Retina | 152 Mm. | 70" | 3,200,000 | 6,800 | Negative. | Secondary Anemia. |
| 4 | 52 | Hemorrhagic Retinitis Subconjunctival Hemorrhage. | 178 Mm. | 85" | 4,040,000 | 7,000 | Albumin, No Casts. | Interstitial Nephritis. |
| 5 | 56 | Retinal Hemorrhages | 210 Mm. | 50" | 3,740,000 | 7,800 | Albumin and Casts. | Interstitial Nephritis. |

| Case | Age | Ocular Diagnosis | Blood Pressure | H. | R.B.C | Blood W.B.C. | Urine | General Diagnosis |
|------|-----|--|-------------------|-------------------|-----------|-----------------|--|--|
| 6 | 34 | Albuminuric Retinitis, | 120 Mm. | 62% $\frac{c}{c}$ | 4,120,000 | 7,600 | Albumin and Casts, | Chronic Parenchymatous Nephritis. |
| 7 | 36 | Subconjunctival hemorrhages, | 110 Mm. | 73% $\frac{c}{c}$ | 5,930,000 | 4,800 | Negative, | Chloro-anemia. |
| 8 | 52 | Albuminuric Retinitis, | 212 Mm. | 78% $\frac{c}{c}$ | 4,030,000 | 7,200 | Albumin and Casts, | Chronic Interstitial Nephritis. |
| 9 | 35 | Retinal Asthenopia and Hemorrhages, | 160 Mm. | 68% $\frac{c}{c}$ | 2,510,000 | 5,000 | Negative, | Pernicious Anemia? |
| 10 | 54 | Arteriosclerosis of Retinal vessels, | 215 Mm. | 78% $\frac{c}{c}$ | 4,120,000 | 6,800 | Albumin, Few Casts, | Arteriosclerosis. |
| 11 | 36 | Tumor of Orbit, | 105 Mm. | 85% $\frac{c}{c}$ | 5,960,000 | 6,400 | Negative, | Orbital Tumor. |
| 12 | 58 | Hemorrhagic Retinitis, | 136 Mm. | 90% $\frac{c}{c}$ | 4,390,000 | 5,000 | Negative, | Arteriosclerosis. |
| 13 | 35 | Hemorrhagic Retinitis, | 110 Mm. | 76% $\frac{c}{c}$ | 3,840,000 | 5,800 | Negative, | Anemia and Intestinal Auto toxemia. |
| 14 | 53 | Subconjunctival Hemorrhages, | 230 Mm. | 90% $\frac{c}{c}$ | 6,050,000 | 5,000 | Albumin, Few Casts, | Interstitial Nephritis. |
| 15 | 48 | Diabetic Hemorrhagic Retinitis, | 120 Mm. | 90% $\frac{c}{c}$ | 5,350,000 | 7,200 | Glucose, | Diabetes. |
| 16 | 38 | Edema of Retina, | 110 Mm. | 95% $\frac{c}{c}$ | 5,050,000 | 7,400 | Negative, | Intestinal Auto intoxication. |
| 17 | 45 | Subconjunctival Hemorrhage, | 160 Mm. | 84% $\frac{c}{c}$ | 4,120,000 | 7,600 | Albumin and Casts, | Early Interstitial Nephritis. |
| 18 | 57 | Albuminuric Retinitis, Hemorrhages, | 155 Mm. | 92% $\frac{c}{c}$ | 5,060,000 | 6,500 | Albumin and Casts, | Advanced Interstitial Nephritis. |
| 19 | 29 | Retinal Hemorrhages, Double Choked Disc, | 135 Mm. | 85% $\frac{c}{c}$ | 4,020,000 | 8,000 | Negative, | Syphilis. |
| 20 | 58 | Retinal Hemorrhages, | 142 Mm. | 80% $\frac{c}{c}$ | 3,910,000 | 7,400 | Albumin, Negative Hyaline Casts, | Interstitial Nephritis. |
| 21 | 78 | Hemorrhage of Right Macula, | 170 Mm. | 75% $\frac{c}{c}$ | 4,800,000 | 7,200 | Albumin, No Casts, | Senile Arteriosclerosis. |
| 22 | 46 | Anemia of Retina, Old, Hem, | 152 Mm. | 67% $\frac{c}{c}$ | 3,650,000 | 6,000 | Albumin, No Casts, | Symptomatic Anemia. |
| 23 | 49 | Albuminuric Retinitis, | 135 Mm. | 85% $\frac{c}{c}$ | 4,420,000 | 7,200 | No Albumin, Casts, | Interstitial Nephritis. |
| 24 | 54 | Hemorrhagic Retinitis, | 236 Mm. | 80% $\frac{c}{c}$ | 4,200,000 | 7,400 | Albumin, Casts, | Interstitial Nephritis. |
| 25 | 43 | Albuminuric Retinitis, | 190 Mm. | 83% $\frac{c}{c}$ | 4,620,000 | 8,000 | Albumin and Casts, | Secondary Contracted Kidney. |
| 26 | 36 | Subconjunctival Hemorrhage, | 135 Mm. | 90% $\frac{c}{c}$ | 4,700,000 | 7,800 | No Albumin, Casts, | Kidney of Pregnancy. |
| 27 | 32 | Albuminuric and Hemorrhagic Retinitis, | 193 Mm. | 85% $\frac{c}{c}$ | 5,010,000 | 7,200 | Albumin and Casts, | Chronic Parenchymatous Nephritis. |
| 28 | 30 | Hemorrhagic Retinitis, | 125 Mm. | 75% $\frac{c}{c}$ | 4,570,000 | 8,000 | Negative, | Secondary Anemia, Overwork and Exhaustion. |
| 29 | 48 | Hemorrhagic Retinitis, | 166 Mm. | 72% $\frac{c}{c}$ | 4,730,000 | 9,000 | Albumin, Casts, | Interstitial Nephritis. |
| 30 | 52 | Albuminuric Retinitis, | 235 Mm. | 60% $\frac{c}{c}$ | 3,400,000 | 6,600 | Albumin and Casts, | Late State Interstitial Nephritis. |
| 31 | 34 | Anemia of Retina with Small Hemorrhages, | 130 Mm. | 65% $\frac{c}{c}$ | 2,510,000 | 130,000 | Albumin, No Casts, | Leukemia. |
| 32 | 64 | Hemorrhagic Retinitis, | 204 Mm. | 60% $\frac{c}{c}$ | 4,350,000 | 7,400 | Albumin and Casts, | Chronic Interstitial Nephritis. |

| Case | Age | Ocular Diagnosis | Blood Pressure | H | R.B.C | Blood W.B.C. | Urine. | General Diagnosis |
|------|-----|--|-------------------|-----|-----------|-----------------|--|--|
| 33 | 45 | Hemorrhagic Retinitis.... | 220 Mm. | 82% | 4,110,000 | 7,600 | Albumin and Casts. | Chronic Interstitial Nephritis. |
| 34 | 36 | Ocular Headache, Subcon- junctival Hemorrhage.... | 122 Mm. | 83% | 4,180,000 | 7,400 | Oxaluria.... | Lithemia. |
| 35 | 64 | Retinal Hemorrhage..... | 166 Mm. | 92% | 5,001,000 | 7,600 | Albumin. No Casts. | Arteriosclerosis. |
| 36 | 54 | Subconjunctival Hemor- rhage..... | 178 Mm. | 99% | 4,992,000 | 8,200 | Albumin. No casts.... | Arteriosclerosis. |
| 37 | 37 | Subconjunctival Hemor- rhage..... | 142 Mm. | 78% | 5,001,000 | 7,000 | No Albumin or Casts. Uric Acid.... | Lithemia. |
| 38 | 47 | Subconjunctival Hemor- rhage..... | 170 Mm. | 90% | 4,000,000 | 7,400 | Albumin and Casts..... | Arteriosclero |
| 39 | 44 | Subconjunctival Hemor- rhage..... | 160 Mm. | 85% | 4,120,000 | 8,000 | Albumin and Casts..... | Chronic Par enchymat ous Nephriti . |
| 40 | 42 | Hemorrhagic Retinitis.... | 152 Mm. | 88% | 4,200,000 | 7,800 | Albumin. No Casts. | Retinal and General Arteriosclerosis. |
| 41 | 58 | Albuminuric Retinitis.... | 158 Mm. | 70% | 3,980,000 | 8,000 | Albumin and Casts..... | Arteriosclerosis. |
| 42 | 59 | Subconjunctival Hemor- rhage..... | 149 Mm. | 84% | 4,010,000 | 6,500 | Albumin and Casts..... | Chronic Interstitia Nephritis. |
| 43 | 62 | Sclerosis of Retinal Vessels. | 162 Mm. | 95% | 4,832,000 | 6,800 | Albumin. No Casts. | Arterioscle rosis and Presenility. |
| 44 | 29 | Albuminuric Retinitis . . . | 148 Mm. | 82% | 4 100,000 | 7,600 | Albumin and Casts..... | Chronic Parenchyma- tous Nephritis. |
| 45 | 72 | Unilateral Retinal Hemor- rhages..... | 232 Mm | 80% | 3,720,000 | 7,200 | Albumin and Casts..... | Arteriosclerosis and Arteriosclerotic Kidney |
| 46 | 36 | Colloid Degeneration of Re- tinal Vessels. | 132 Mm. | 68% | 3,840,000 | 4,800 | Albumin Trace. Casts few. | Beginning Retinal De- generation. |
| 47 | 45 | Retinal Hemorrhage. | 144 Mm. | 82% | 4,120,000 | 6,800 | Albumin. No Casts. | Early Arteriosclerosis |
| 48 | 43 | Macular Hemorrhage.. | 136 Mm. | 88% | 4,020,000 | 7,200 | Albumin. No Casts. | Early Cirrhotic Kid- ney. |
| 49 | 54 | Retinal Hemorrhage. | 255 Mm. | 55% | 3,640,000 | 6,800 | Albumin and Casts..... | Chronic Interstitial Nephritis. |
| 50 | 63 | Silver Wire, Retinal Vessels | 140 Mm. | 75% | 4,114,000 | 6,200 | Albumin. No Casts.... | Arteriosclerosis |
| 51 | 56 | Retinal Congestion, slight Hem. and Edema | 148 Mm. | 92% | 5,001,000 | 7,400 | No Albumin No Casts. | Passive Cerebral Con- gestion result of Aneu- rysm |
| 52 | 36 | Subconjunctival Hemor- rhage..... | 141 Mm. | 94% | 5,020,000 | 7,800 | No Albumin No Casts Uric Acid | Lithemic Hyperten- sion Progressing to- ward Cirrhotic Kidney |
| 53 | 33 | Albuminuric Retinitis . . . | 122 Mm. | 60% | 3,842,000 | 6,800 | Albumin and many Casts.. | Chronic Parenchymat- ous Nephritis |
| 54 | 53 | Albuminuric Retinitis. . . | 294 Mm. | 70% | 4,020,000 | 7,200 | Trace Alb. Few Casts.... | Chronic Interstitial Ne- phritis |
| 55 | 46 | Diabetic Hemorrhage Reti- nitis. | 110 Mm. | 84% | 4,700,000 | 7 400 | Glucose Pres- ent. Albumin and Casts Negative. | Diabetes |
| 56 | 44 | Hemorrhagic Retinitis | 185 Mm. | 90% | 4,328,000 | 7,200 | Albumin Neg- ative. Casts Negative. | Sudden Vascular Rup- ture under excitement in case of Early Ath- eroma. |

| Case | Age | Ocular Diagnosis | Blood Pressure | H. | R.B.C. | Blood W.B.C. | Urine | General Diagnosis. |
|------|-----|--|-------------------|-----|-----------|-----------------|----------------------------------|--|
| 57 | 66 | Cataract and Conj. Hemorrhage..... | 164 Mm. | 66% | 3,600,000 | 5,400 | Albumin and Cast Present. | Chronic Interstitial Nephritis. |
| 58 | 43 | Retinal Hemorrhage..... | 232 Mm. | 95% | 5,100,000 | 7,800 | Albumin Casts Present. | Chronic Interstitial Nephritis. |
| 59 | 46 | Retinal Hemorrhage..... | 260 Mm. | 75% | 5,340,000 | 11,000 | Albumin and Casts.... | Chronic Interstitial Nephritis. Reduced Pressure to 180. |
| 60 | 27 | Recurrent Iritis and Retinal Hemorrhage..... | 126 Mm. | 90% | 4,800,000 | 7,200 | Alb. Trace. Cast Neg. | Specific Iritis. |
| 61 | 40 | Retinal Hemorrhage..... | 188 Mm. | 88% | 4,621,000 | 7,800 | Alb. Neg. Casts Neg. | Arteriosclerosis. |
| 62 | 58 | Retinal Hemorrhage..... | 178 Mm. | 90% | 4,392,000 | 8,000 | Alb. Trace. No Casts. | Arteriosclerosis. |
| 63 | 50 | Retinal Hemorrhage..... | 148 Mm. | 87% | 4,862,000 | 7,900 | Alb. Trace. No casts.... | Interstitial Nephritis |
| 64 | 63 | Glaucoma. Subconjunctival Hemorrhages..... | 225 Mm. | 96% | 5,010,000 | 8,200 | Alb. Trace. Few Casts.... | Glaucoma and Interstitial Nephritis |
| 65 | 59 | Retinal Hemorrhages..... | 265 Mm. | 90% | 4,110,000 | 7,600 | Alb. and Casts | Interstitial Nephritis |
| 66 | 69 | Retinal Hemorrhages..... | 195 Mm. | 69% | 3,800,000 | 7,200 | Alb. Excess. Casts numerous..... | Moderate Cardiac Dilatation. Chronic Nephritis |
| 67 | 38 | Retinal Hemorrhage..... | 160 Mm. | 76% | 4,160,000 | 7,600 | Alb. Trace. Few Casts.... | Chronic Nephritis. |
| 68 | 45 | Retinal Hemorrhage..... | 195 Mm. | 94% | 4,980,000 | 7,800 | Alb. Trace. No Casts.... | Arteriosclerosis. |
| 69 | 54 | Retinal Hemorrhage..... | 212 Mm. | 91% | 4,601,000 | 7,000 | Alb. Trace. Casts few.... | Chronic Interstitial |
| 70 | 54 | Retinal Hemorrhage..... | 226 Mm. | 95% | 4,872,000 | 7,200 | Alb. Trace. Few Hyalin... | Chronic Interstitial |
| 71 | 58 | Hemorrhagic Retinitis.... | 164 Mm. | 72% | 4,211,000 | 8,000 | Alb. Trace. Few Casts.... | Arteriosclerosis. |
| 72 | 36 | Hemorrhagic Retinitis. Choked Disc..... | 242 Mm. | 83% | 4,480,000 | 7,000 | Much Album. Many Casts.... | Chronic Parenchymatous Nephritis. |
| 73 | 53 | Retinal and Subconjunctival Hemorrhage..... | 179 Mm. | 86% | 4,040,000 | 7,400 | Alb. Trace. Few Casts.... | Interstitial Nephritis. |
| 74 | 57 | Hemorrhagic Retinitis.... | 243 Mm. | 54% | 3,622,000 | 6,200 | Albumin and Casts..... | Interstitial Nephritis. |
| 75 | 36 | Albuminuric and Hemorrhagic Retinitis..... | 144 Mm. | 62% | 3,921,000 | 6,800 | Albumin and Casts..... | Chronic Parenchymatous Nephritis |
| 76 | 54 | Arteriosclerosis of Retinal Vessels. Small Hemor.... | 215 Mm. | 78% | 4,013,000 | 7,400 | Alb. Trace. Few Casts.... | Interstitial Nephritis. |
| 77 | 60 | Hemorrhagic Retinitis.... | 130 Mm. | 92% | 4,382,000 | 5,000 | Alb. Trace. No Casts.... | Arteriosclerosis. |
| 78 | 52 | Subconjunctival Hemorrhages..... | 234 Mm. | 84% | 5,020,000 | 5,800 | Albumin. Few Casts.... | Interstitial Nephritis. |
| 79 | 46 | Subconjunctival Hemorrhages..... | 164 Mm. | 85% | 4,320,000 | 7,000 | Alb. Trace. Occasional Cast..... | Early Interstitial Nephritis |
| 80 | 79 | Macular Hemorrhage..... | 178 Mm. | 78% | 3,960,000 | 6,200 | No Alb. Few Casts Albumin | Senility. Arteriosclerosis. |
| 81 | 54 | Retinal Hemorrhages..... | 235 Mm. | 81% | 4,196,000 | 8,000 | Albumin Trace. Many Casts.... | Chronic Interstitial Nephritis. |
| 82 | 31 | Albuminuric and Hemorrhagic Retinitis..... | 194 Mm. | 86% | 4,680,000 | 7,200 | Much Alb. Many Casts. | Chronic Parenchymatous Nephritis. |

| Case | Age | Ocular Diagnosis. | Blood Pressure | H. | R.B.C. | Blood W.B.C. | Urine | General Diagnosis. |
|------|-----|---|-------------------|-----|-----------|-----------------|---|---|
| 83 | 65 | Hemorrhagic Retinitis.... | 232 Mm. | 62% | 3,420,000 | 6,900 | Albumin. Many Casts... | Advanced Interstitial Nephritis..... |
| 84 | 64 | Hemorrhagic Retinitis.... | 168 Mm. | 86% | 4,021,000 | 6,800 | Albumin. No Ca ts.... | Arteriosclerosis..... |
| 85 | 38 | Subconjunctival Hemorrhage | 144 Mm. | 78% | 5,010,000 | 7,200 | No Albumin or Casts Uric Acid.... | Lithemia..... |
| 86 | 43 | Retinal Hemorrhage..... | 153 Mm. | 87% | 4,121,000 | 8,000 | Alb. Trace. No Casts.... | Early Arteriosclerosis |
| 87 | 71 | Retinal Hemorrhage..... | 230 Mm. | 81% | 3,890,000 | 4,800 | Alb. Trace Few Casts.... | Arteriosclerosis and Arteriosclerotic Kidney |
| 88 | 55 | Retinal Hemorrhage..... | 255 Mm. | 61% | 3,640,000 | 6,800 | Albumin and Casts..... | Chronic Interstitial Nephritis..... |
| 89 | 57 | Retinal Hemorrhage..... | 184 Mm. | 64% | 3,890,000 | 7,200 | Albumin and Casts..... | Chronic Interstitial Nephritis..... |
| 90 | 28 | Albuminuric Retinitis.... | 146 Mm. | 73% | 4,001,000 | 7,600 | Much Alb. Many Casts... | Chronic Parenchymatous Nephritis..... |
| 91 | 57 | Retinal Hemorrhage..... | 156 Mm. | 96% | 5,010,000 | 8,000 | Alb. Faint Trace, No Casts..... | Arteriosclerosis.... |
| 92 | 33 | Albuminuric and Hemorrhagic Retinitis | 124 Mm. | 72% | 3,920,000 | 7,800 | Much Alb. Many Casts... | Chronic Parenchymatous Nephritis..... |
| 93 | 44 | Hemorrhagic Retinitis.... | 181 Mm. | 88% | 4,231,000 | 7,200 | Alb. Negative Casts Few.... | Early Arteriosclerosis |
| 94 | 67 | Subconjunctival Hemorrhage | 165 Mm. | 68% | 3,920,000 | 7,400 | Alb. Present. Few Casts... | Chronic Interstitial Nephritis..... |
| 95 | 43 | Retinal Hemorrhage..... | 228 Mm. | 81% | 4,200,000 | 7,600 | Albumin and Casts Present | Chronic Interstitial Nephritis..... |
| 96 | 47 | Retinal Hemorrhage.... | 196 Mm. | 80% | 4,021,000 | 8,000 | Alb. Trace. Casts Numerous.... | Early Arteriosclerosis Cirrhotic Kidney. |
| 97 | 51 | Retinal Hemorrhage.... | 218 Mm. | 92% | 4,211,000 | 6,800 | Alb. Trace. Casts Few.... | Chronic Interstitial Nephritis..... |
| 98 | 50 | Retinal and Subconjunctival Hemorrhage | 152 Mm. | 90% | 4,078,000 | 9,000 | Alb. Trace. No casts.... | Generalized Arteriosclerosis..... |
| 99 | 31 | Albuminuric and Hemorrhagic Retinitis.. | 118 Mm. | 66% | 4,112,000 | 8,200 | Alb. Excess. Num. Casts... | Chronic Parenchymatous Nephritis..... |
| 100 | 63 | Retinal Hemorrhage.... | 22 Mm. | 97% | 4,820,000 | 76,800 | Alb. Trace. Casts Numerous.... | Chronic Interstitial Nephritis..... |

Eighty per cent. (80%) of the above cases occurred in diseases in which hypertension is the rule and if not a constant accompaniment, the cardiac hypertrophy present would be sufficient, under extreme exertion or emotion, for the arterial pressure to become decidedly elevated.

By far the largest percentage of retinal hemorrhages were found in chronic interstitial nephritis, 40 per cent; arterio-sclerosis second with 24 per cent; and chronic parenchymatous nephritis third with 13 per cent. The figures are suggestive, in that it is to diseases of the kidney, first, and of the arteries secondly, that our at-

tention should be directed when seeking the cause of a given case of retinal apoplexy.

This series will also serve to clarify existing knowledge upon the relative frequency of these various causes which are usually merely listed in most textbooks, without reference as to which organ or system should be investigated first.

Anemia—simple, pernicious and leukemic—made up 6 per cent of our cases, there being one of spleno-myelogenous leukemia, in which hemorrhages is rather uncommon, and one early case of pernicious anemia. In all but one instance there were hemorrhages of some type and the blood pressure, with one exception, was subnormal.

Singularly, the cases of lithemia, 4 per cent, revealed only subconjunctival hemorrhages—in none was it possible to determine the presence of even minute retinal hemorrhages. A moderate degree of hypertension for the age was the rule.

In two instances, no other diagnosis could be made but that of intestinal autointoxication, there being vertigo, persistent drowsiness and an excess of indican and skatol found in repeated urinalyses. Both were examples of hypertension; one showed hemorrhage, the other edema of the retina.

Diabetic retinitis with hemorrhages furnished two cases: in both, the blood pressure was subnormal, they belonging to the toxic group of causes of retinal apoplexy.

Secondary syphilis, a comparatively rare cause of these hemorrhages, was the etiologic factor in two instances: in one, there was an accompanying iritis; in the other, beginning choked disc; in neither was the arterial pressure unduly high. The single instance in which aneurysm was the only ascertainable cause, failed to manifest any abnormality of the blood, blood pressure, or the kidneys.

I am sure that increased arterial pressure is an important factor in the causation of acute glaucoma. It may be interesting to know that in one case of acute glaucoma, where the blood pressure was 265 mm., twenty ounces of blood was taken from the right arm, when the pressure fell to 150 mm. This patient had an attack of acute glaucoma in the right eye two years before. An iridectomy was performed by a skilled operator, but it was not successful. The blood pressure was evidently so high that the eye was lost by an immediate intraocular hemorrhage and collapse of the eyeball. When the patient came under my care for a similar attack in the left eye, with tension plus 3 and over, and vision gone

for two days, I concluded that a reduction of tension of the eyeball must be obtained somehow before a successful iridectomy could be hoped for. The patient being at this time without light perception, Eserine had failed to make any impression on the dilated pupil, or tension of the eyeball whatsoever. It was interesting to note the condition of the pupil after 10 ounces of blood had been drawn from the arm: it commenced to contract, and by the time 20 ounces were taken and tension fell to 150 mm., the pupil contracted to a pinhole and the tension of the eyeball was about normal. I was then able to perform an iridectomy without any untoward results and useful vision followed. I am positive that by reducing, first the arterial pressure from 265 mm. to 150 mm., and secondly, of giving the eserine an opportunity to act mechanically in aiding the reduction of the tension of the eyeball, I succeeded with the operation, whereas otherwise I should probably have failed.

TREATMENT.

This subject will be considered only with reference to the departures from the usual line of therapy pursued in this class of cases. In those cases wherein the pressure was found to be abnormally high, in addition to rest, exclusion of light and the usual local measures, we found that absorption of the clot occurred far more rapidly (from one to three weeks sooner) by employing the following method:

All plethoric cases and those with greatly increased arterial tension were admitted to the hospital and immediately bled from the median basilic vein, following the technique usually employed in venesection for any other condition. The sphygmomanometer was adjusted to the opposite arm and the pressure recorded every three minutes. It was found that it was rarely necessary to reduce it lower than 110 mm.; for those with original pressure from 150 to 200 mm. Cases presenting systolic pressures of 200 mm. or over were seldom reduced lower than 150 mm. We were often compelled to desist before these reductions occurred, owing to faintness of the patient.

In the less robust, somewhat anemic cases, we practiced relieving hypertension with the aid of hot-air baths, electric light baths, or even hot packs. This was found to be nearly as effectual as bleeding in hastening absorption and the restoration of function of the affected eye. In the obese, and when, for any reason, bleeding was refused or was impracticable, thyroid extract gr. ii, t. i. d., was of considerable use as a vasodilator and to diminish the viscosity of the blood. The above methods, while partially satisfac-

tory, did not tend to produce the freedom from recurrence which characterized the cases upon which venesection was performed. A number of chronic nephritides, with whom retinal hemorrhages had been habitual for months, have been entirely free from attacks during two years following this treatment. Although within the twenty-four hours following the bleeding the blood pressure recorded was higher than the elevation taken previous to venesection, there was a daily decline of approximately 10 mm. per diem for three to four days, which latter pressure was usually maintained for several weeks, at least as long as our observation continued. The routine treatment after the patient left the hospital was carefully regulated nitrogenous diet, alkaline waters freely and warm baths, 110° for ten minutes, thrice weekly. Medicinal arterial relaxants were used, as sodium iodide gr. v. in conjunction with sodium nitrite gr. i. three times daily for three weeks of each month, omitting every fourth week.

In those cases with markedly hemorrhagic tendencies, as where there were both subconjunctival and retinal extravasations, gallic acid gr. x. three or four times daily was added to other measures. Hydrargyrum cum creta, gr. i. t. i. d., was used in the autotoxic cases and where the liver and intestinal tract seemed to be principally at fault.

The cases of primary and symptomatic anemia, diabetes and syphilis were of course not treated by venesection.

CONCLUSIONS.

First—A large proportion, 80 per cent. of retinal hemorrhages occur in individuals suffering from a temporary or permanent high arterial blood pressure, due to the causes enumerated.

Second—This excessive intravascular pressure is apparently the most frequent exciting cause of these hemorrhages.

Third—Venesection has proven of value, not only in reducing dangerously high pressure, but in acting as a powerful stimulus to a speedy absorption of the clot.

FURTHER EXPERIENCE WITH THE SMITH-INDIAN OPERATION IN THE EXTRACTION OF FIFTEEN CATARACTS.*

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The recent visit of Major Smith to this country, his address before the American Ophthalmological Society at New London, Conn., "On the Operative Treatment of Immature Cataract," the

*Read before American Academy of Ophthalmology and Otolaryngology, Cleveland, August, 1908.

operative clinics which he held in New York, which it was my privilege to attend, and the articles in *Archives of Ophthalmology* January, 1908, by Dr. Arnold Knapp, describing what he saw at Jullundur, India, and the very brief description of the 100 extractions, many of which he made, have all served to draw attention to this operation, and in addition reports of the small number of operations made in this country have appeared from time to time, so that it has perhaps received more thought and attention than any other operation for cataract from the time of von Graefe.

From the beginning, the desire of the profession has been for a *reasonably* safe manipulation in the extraction operation which would remove the capsule with the lens. All have recognized the undesirability of leaving it behind and the surgical incompleteness of all operations which do so. Witness the early efforts of Richter and Beer, the later efforts of Sperino and de Wecker, and the still later method of Pagenstecher and McNamee to accomplish this end. All of these methods came to naught, because they added to the usual steps the passing into the vitreous of a scoop or vectis to deliver the lens by traction often with rupture of the capsule, and almost certain loss of the vitreous, such violence few eyes could withstand, and the methods never gained in professional favor. In the *Indian Medical Gazette*, "Calcutta," July, 1900, there appeared an article by Captain Henry Smith, I. M. S., a civil surgeon at Jullundur, Punjab, North India, in which he advised a return to the method of extracting the lens in the capsule, *but by external manipulation*. He submitted the facts and statistics to support his contention that it was a more perfect surgical procedure and gave better visual results than the orthodox operation which opens the capsule and leaves it behind, often with cortical debris, which in a way not well understood, often causes intraocular inflammation, and in the same journal of June, 1901, another article appeared giving his further experience with the method. These journals are only referred to because they are not accessible to many students and one should know where to find the material for the study of the method from its inception in order to reach proper conclusions regarding it, and know the different steps in the evolution of the operation. A description of the steps of the operation in book form will appear from his pen about January 1st. It is a matter of historical interest that Major Smith should have extracted over 20,000 cataracts in eighteen years, 17,000 of them within the capsule, 5,000 without iridectomy and the balance with iridectomy;

but of greater interest to us is the fact that with his matured judgment and ripened experience as an operator, he should today be the warmest advocate and steadfast friend of extraction within the capsule, and stranger than all is the fact that with all this admitted and with the unequal statistics which he has offered in support of the superiority of the operation, he has comparatively few followers. Why this is so, I am not certain, but rather think that men refrain from doing the operation because of its apparent formidableness, fear of loss of vitreous, and the difficult technical details of its execution, and the general idea abroad that vision is not better and the risk greater than after the regular operation, and with private patients greater responsibility exists. This deters many from performing the operation. There is no good reason why vision should not be better and remain better, and Smith asserts that it is both, and there is no reason, as I see it, why the risk of the operation should be greater than after orthodox methods, and one is sure of being rid of the capsule. It is unfortunate that with Major Smith's statistics he is not able to give us exact information concerning the evil which may come remotely to an eye from which vitreous has been lost, and tags of iris or a thread of capsule have become entangled in the wound. These accidents are looked upon in this country with great apprehension, and the whole future of the method depends upon the role they are shown to play. Major Smith's *ipsi dixit* statement that loss of vitreous seldom does harm, is probably true in his experience, as the loss is usually small in his skillful hands, and only occurs in 8 per cent of his operations, and the average Indian being of a low order of civilization, the catabolic changes in his tissue from a simple vegetable diet do not conduce to inflammatory reaction and the additional fact should be remembered that many of these patients have to come hundreds of miles to be operated on, their stay is short at the hospital, and they are usually lost to him after they return home, and he cannot often know what ultimately happens to their eyes, and the additional fact that few can read, makes the testing of vision difficult even with the devices he has constructed for that purpose. It is a matter of great satisfaction to be able to state, however, that all cases having had vitreous loss, etcetera, that can be gathered together are to be re-examined by Major Smith and his assistants with the aid of Dr. Jamison, who goes to India as the representative of Moorefields for this express purpose this fall. Smith contends that the vitreous is reproduced when lost,

and asks why it should not be? And that a loss equal to one-third its volume does no harm in his experience. This is a question for the pathologists to determine. We shall soon know the exact truth on this point and no one seems more desirous than Major Smith that the truth, the whole truth, and nothing but the truth, shall go out from his clinic. I know of no accidents or complications of the Smith operation that are not inherent in all regular or orthodox operations, and it has some advantages over them. If a cataract is over ripe, the cortex milky and nucleus small, and the zonula weak, or the vitreous fluid, it is easy to lose vitreous by any method and to have iris prolapse. I can only answer those who are critical about this accident or complication that my limited experience is in line with that of Major Smith; I have not seen loss of vitreous do harm in any case up to the present time. Smith does not attempt to extract all cataracts in the capsule. Perhaps there is 25 per cent more risk of loss of vitreous by the Smith method for the *novice* in any case, but one of Smith's contentions is that the amount of vitreous lost is small as a rule, compared to that lost in the regular methods of the delivery of the lens, and the elimination of the capsule is quite an additional advantage, and for the extraction of immature cataract, the method is superior to any process of artificial ripening and extraction afterward. For quick delivery of the lens in emergencies, Major Smith has devised an instrument, similar to the Daviel spoon, but has made it flatter and more curved. Perhaps a flat spud would convey a better idea of its shape, the spud portion being 8 m/m wide by 12 m/m long on one end, and with his approval I have modified it so that the other end is 4 m/m wide by 12 m/m long, and he has shown how to hold it in the left hand, and use it as an aid in the expression of the lens, and if loss of vitreous occurs, to pass it well back of the lens, *to support it*, and using the spoon as an incline plane upon which the lens will glide to its exit by the pressure of the strabismus hook on the cornea below. Of course there is no reason why this should not be used when vitreous is being lost in any operation, and any one who will try it, will recognize its superiority over scoops, double hook, etcetera, *because the lens can be delivered thus in the capsule*. If Major Smith has done nothing more for the cataract operation than to show how to deliver the lens quickly with this instrument, with small vitreous loss, he should have the credit, which so far as I know belongs to him alone. But there is much more to his credit. So far as I can learn, the idea

of delivering the lens by external manipulation, no instrument except the knife entering the eye, the purpose being to deliver the lens in the capsule, *by expression, not by traction*, should also be credited to him. If it be granted that after all these years there are still inherent defects in all orthodox methods of extraction which so far have not been overcome. We come to consider what Smith regards as the lesser of two evils in extraction (possible vitreous loss, entanglement of iris, and tags of capsule in the wound) on the one hand, and the greater evil, that of leaving behind the capsular bag itself with cortical debris to form an after cataract, which will require one or more knife-needle or scissor operations, with possible infection, glaucoma and the evils named above in addition. I do not recall any essential improvements in the steps of the cataract operation from the time of von Graefe until now, unless the Smith operation proves to be an improvement. No one by simply looking on at an operation at a distance of several feet can judge whether it is or is not an improvement on older methods. *Theoretical conditions do not apply*, and no one is capable of judging whether the operation is or is not an improvement, unless he has made it several times himself, and has watched the cases for some time. Because some of the steps of the operation are radical departures from old methods, does not signify that they are rough or unscientific. Major Smith repeatedly demonstrated on the palm of the hand that the pressure used to express the lens was not such as an on-looker would estimate it to be, in fact, the thought of excessive pressure being used, refutes itself. But he insists that the eye must look straight forward, that the pressure must be in the half circle around the lower half of the cornea, about 2 m. in from its scleral border, and be backward, steady, uninterrupted and varied to the changing position of the lens in its exit, and in no case must the strabismus hook be used to make traction on the lens up toward the incision.

I have in *Ophthalmology*, January, 1907, recorded my experience with 22 cases of extraction within the capsule which were not favorable to the operation as a whole, and others have recorded a like experience. Recently I saw Major Smith make three extractions in New York, and spent several hours with him listening to detailed descriptions of his method. Speaking for myself alone, I now know after recent experience gained in fifteen operations, that my so-called Smith operations of two years ago were not properly made Smith operations. In the first series, I only suc-

ceeded in delivering 50 per cent of lens in the capsule and in this latter series, over 80 per cent.

In the last fifteen cases the capsule ruptured once from the prick of the knife in making the section. Insignificant loss of vitreous occurred three times. No case of glaucoma has so far developed and no well marked case of iritis. I think there can be no doubt that fewer cases of iritis will be met with when the capsule is not ruptured.

From the criticisms one hears of the Smith operation, we are led to ask ourselves what good ground is there for such criticism? Have we attained to such a degree of perfection in the regular operation that no farther improvement can be made, or are we at the parting of the ways, and must either go forward or stand still? If the orthodox operation is not entirely satisfactory as to visual results from capsular remains and cortical debris, and inflammatory reaction and the treatment of the after cataract, theoretically the Smith operation should be satisfactory, as it eliminates all of the causes of poor vision and the after cataract, other things being equal. Practically it is open to the objection that it is a more difficult operation to perform, that more delicate and sometimes prolonged manipulation is required to deliver the lens. This favors the development of stripped or lattice keratitis, but I have been surprised and gratified several times at the clear black pupil and the slight reaction in the cornea which has followed prolonged effort at delivery.¹ This I think can easily be overcome by practice. Major Smith has told me that he can average 20 cases an hour. In only one case of prolonged effort at expulsion of the lens, has lattice keratitis remained and reduced vision to 1/200, which is gradually clearing up under prolonged use of diosin applied in powdered form, and in one other case I have seen faint striated opacity running downward and backward through the vitreous sufficient to reduce vision from 20/30 to 20/50 in two weeks.¹ No vitreous had been lost at the time of operation, but a considerable ill-defined reaction had followed the operation with prolonged healing and plus tension, which yielded to paracentesis and eserine. Blood pressure was 190 mm Hg. in this case. I have so often observed B. P. above 180 mm Hg. in cases of delayed healing, that I advise its reduction before operating.

Stripped keratitis I have seen in two cases, probably from too small a section and the unusual manipulation required to de-

¹ While reading this proof the patient came in. Under the use of powdered diosin daily for one week vision = 20/30 again.

liver the lens, but they have cleared up. Having said this much in favor of the operation, and having admitted its strong and weak points and being impressed with the correctness of the principles which underlie it, as I understand them, and comparing them with the orthodox operation, I am favorably impressed with it, and shall continue to practice it in all suitable cases, and I believe it has a great future, perhaps not for every operator, but in the hands of the few who will learn to do it well. Still, having said this much, I do not wish to appear as a champion of the Smith operation until I have seen more of the reactions and final results from it, among the white people living under different climatic and dietetic conditions and under a higher civilization than the people of India, the question of the relative safety of the two methods of operating must remain subjudice until this is settled.

I expect to sail for India December 22 to spend about two months in Major Smith's clinic. He has offered me every inducement to visit him in Jullundur, and the privilege of learning the operation under his direction. Since this paper was written, I have made more than twenty-five more extractions, but the time has been too short to present them with carefully prepared statistics.²

PRIMARY PIBULBAR MELANO-SARCOMA.

JULIUS GROSS, M. D.,

ST. LOUIS, MO.

Sarcoma of the conjunctiva may be counted among the diseases that occur very seldom. Lyder Borthen found it only eight times in a series of 15,000 cases of diseases of the eye. Clegg and Hall state that only three cases were observed in an examination of 520,523 out-patients at the Manchester Royal Eye Clinic. Verhoeff and Loring, in searching the records of the Massachusetts Charitable Eye and Ear Infirmary, found only two cases among 44,719 patients.

According to Koeppel sarcoma of the conjunctiva is most apt to occur at the age of 60 to 70 years. However, it may occur at any age. Many writers (among them Verhoeff and Loring) believe that immediate enucleation is the safest and best operation in these cases. However, others (among them Saemisch) believe that an effort to save the eye should always be made.

Melano sarcomata have usually been classed as sarcomata, although some writers have held that it would be better to class them

²—It will be understood that the statistics given only refer to the first fifteen cases.

with epitheliomata. Among those who consider them as sarcomata are: Saemisch, Greef and Axenfeld. Panas believe them to be epitheliomata. Leber also inclines to this view. Virchow speaks of *Sarcoma carcinomatoides*. Ribbert, professor of pathology at Gottingen, in his text book on tumors (*Geschwulstlehre*) devotes considerable space to this subject, which he has also illustrated with splendid original drawings of melano-sarcomata, or as he prefers to call them, melanomata. Ribbert says: All melanomata, whether of the skin or of the eye, must be placed in a single group. Secondly, these tumors must because of their characteristic behavior necessarily be traced to certain cells in which the ability to form pigment is inherent. We must not think that a new growth of any kind may now and then form pigment. The melanoma is a typical neoplasm, just as typical as any other. As the chondroma develops from a proliferation of the cartilage cells, the carcinoma from a proliferation of the epithelium, so the melanoma develops from a proliferation of the pigment cells, the chromatophores. Therefore I call the growth chromatophoroma.

Report of Case.

M. F., female, age 21 years, of medium stature, dark brown hair, dark brown eyes, presented herself May 27, 1906, because of a growth at the nasal limbus of right cornea.

Family history good. No history of neoplasm or any other hereditary predisposition. Patient has never had any trouble with her eyes. No history of any injury. Previous general health good.

About six months ago members of her family noticed something like a scratch at the nasal limbus in the horizontal meridian of right cornea, soon after this the small black mass of the tumor was noticed. Since it was first noticed, it had grown slowly but steadily. For the last six months or so she has not been feeling well, no particular complaint, just a general indisposition. One year ago she weighed 118 pounds, but now weighs only 122.

In the horizontal meridian of the right eye at the nasal limbus of the cornea there is a black growth measuring 2 mm. in the vertical, 1.5 mm. in the horizontal and rising above the level of the globe about 1.5 mm. The growth rises abruptly at the corneal side to descend gradually to the conjunctival end. The base is somewhat constricted so that the edges protrude flap-like over the base. It is firmly and unmovably attached to the corneal limbus. Its color is a shining black. There is no increased vascularization near the tumor nor elsewhere on the globe. The color of the iris

is a dark brown. There are no naevi pigmentosi nor pigment spots noticeable in the circumcorneal zone. The fundus is normal and there is no sign of any growth in the eyes or elsewhere so far as I was able to ascertain.

With the kind advice, and under the direction of Dr. A. E. Ewing, the tumor was removed in the following manner. It was firmly grasped with forceps and trimmed off from the cornea with a broad double-edged, round pointed knife having its cutting edge at the end. In a like manner it was cut off from the scleras. The site of the wound was then carefully curetted with the knife and a small suture placed in the conjunctiva.

The wound healed nicely with scarcely a scar. There has been no recurrence at this date (after twenty months). The vision is as good now as before the operation.

Microscopic examination shows that the tumor is covered by the epithelium, which does not dip into the growth. There are three well-defined pigmented areas of dark brown color in which there are many cells, of medium size, containing pigments; there is also pigment in the intercellular substance. Surrounding these areas there are many smaller roundish cells, which make up the greater part of the tumor. The tumor cells are invading the conjunctival tissue. The blood vessels are not very numerous. The pigmented cells are chromatophores, and the smaller cells are also chromatophores which have not developed pigment.

DISCUSSION: Dr. Adolph Alt had seen several of these cases and had seen one unpigmented sarcoma. That was about twenty years ago. The patient had a tumor at the cornea-scleral margin. He had removed it and in a few weeks it returned and he had again removed it. After three months' it returned and the eye was removed. This man had, within the last year, been operated upon for a tumor of the trachea. Of course the papilloma of the trachea had nothing to do with the sarcoma. The peculiar cells found in these tumors made it exceedingly hard to determine whether they were epithelioma or not.

Melanoma of Iris (Presentation of Patient).

Dr. F. E. Woodruff: Miss E. S., age twenty-two, presented herself for treatment with the following history: About two years ago she noticed a black streak at the inner lower quadrant of the right eye, in the anterior chamber, the growth extending from pupillary margin to the circumference of the iris. She noticed no change in this black streak for some two years, but in the last three

months it has increased considerably in size until it now occupies the inner lower fourth of the anterior chamber. There has been at no time any pain nor any ciliary injection so far as I could learn; no symptom of neoplasms in other parts of the body. The presence of this melonoma may indicate either a benign or a malignant condition, but simple melanomata are frequently only the precursors of malignant condition. The rapid growth during the last three months would point to malignancy. The growth seems to be a proliferation of the pigment stroma. Without microscopical examination it is impossible to make a positive diagnosis. This the patient refuses to have done. The condition, however, I believe to be one of malignancy and the ultimate outcome will be an enucleation.

DISCUSSION: Dr. Adolph Alt thought it was a primary melanosarcoma of the iris. These tumors grew very slowly. As to whether the eye should be at once removed, he suggested that an iridectomy be done and the specimen turned over for examination. In a number of cases such a sarcoma had been removed by an iridectomy with no return of the condition. It would be worth while to make the attempt, at least.

BREAKING OFF OF THE POINT OF KNIFE WHILE PERFORMING IRIDECTOMY.

BY WALTER HAMILTON SNYDER, M. D.

TOLEDO, OHIO.

While performing iridectomy for glaucoma in an eyeball (tension -- 2) and using a new Weiss knife, the point broke off.

The puncture was made and at the instant I touched the cornea for the counterpuncture I felt a slight shock and immediately saw the point of the knife sticking inside the cornea. The broken point was nearly a millimeter in length from point to base. I at once withdrew the broken knife, took out the speculum and waited a few minutes, then did a post-equatorial sclerotomy and completed the corneal section with a new knife.

I had my magnet with me, a Johnson, but the only current in this hospital is alternating, so I dislodged the minute point with a spatula and performed a large iridectomy and received the point in the iris removed.

My knife was a medium wide Graefe made by Weiss and had never been resharpened or used before.

One of my colleagues tells me he had a similar accident, but they are comparatively rare.

I have avoided using the narrow needle points the American instrument sharpeners insist on putting on their cataract knives because of the possibility of this accident, besides difficulty in making counterpuncture, and prefer the rather wide point such as Weiss puts on his knives.

With a proper magnet there would be but little trouble in removing the foreign body, but this case is interesting as one when no magnet was available, but the wide iridectomy was what I intended doing, so the end result was as good as if nothing had happened.

211 ONTARIO STREET.

New Books

A SYSTEM OF OPHTHALMIC THERAPEUTICS. Being a Complete Work on the Treatment, Including the Prophylaxis, of Diseases of the Eye. Edited and chiefly written by Casey A. Wood, M. D., C. M. D. C. L., formerly Professor of Ophthalmology and Head of the Department, Northwestern University Medical School; Late President of the American Academy of Medicine, of the American Academy of Ophthalmology and of the Chicago Ophthalmological Society; Ex-Chairman of the Ophthalmic Section of the American Medical Association; Mitglied der Ophthalmologischen Gesellschaft, etc. Illustrated and completely indexed. Chicago: Cleveland Press, 1908. Cloth, \$7.00; Half Morocco, \$8.50. Read in November. Sold only by subscription.

AUTHOR'S INTRODUCTION.

Although there are, in English, several small monographs, mostly translations of foreign prints, on Ophthalmic Therapeutics, there is none in any language that gives a full account of the treatment of eye diseases from the earliest to the latest times. The present volume proposes to fill this gap in ophthalmic literature, especially from the standpoint of ocular therapy as it is practiced in America.

In addition to a full account, including their chemistry and pharmacology, of those agents that are therapeutically applied to the eye, a chapter is devoted to remedies that are commonly given internally in eye diseases, their pharmaceutical relations, dosage, method of administration, contra-indications and the opinions concerning them of those ophthalmologists who have given particular

attention to their administration. In the same way are treated the various classes of ocular remedies—the astringents, cycloplegics, miotics, caustics, cauterants, antiseptics, germicides, analgesics, anesthetics, mydriatics, ciliary tonics, vasomotor constrictors and dilators, counter-irritants, etc.

Chapters are devoted to remedial forms, methods and appliances, blisters, liniments, vapors, ointments, collyria, pencils, tablets, discs, oily mixtures sub-conjunctival medication, hypodermic injections, massage, local baths, compresses, bandages, eye-cups, medicine droppers, sprays, etc.

Following these introductory chapters the individual eye diseases are taken up and the appropriate treatment of each of them is fully discussed.

In the text, cross references are frequently made to therapeutic agents mentioned, so that the reader may not only learn when some particular remedy is advised, but he may at once be acquainted with its chemical, pharmaceutical and therapeutic relations—may learn what the remedy is, in what dosage, under what circumstances and how often it should be employed.

Even if the ophthalmologist does not himself treat those general conditions that give rise to or are associated with ocular affections he should be acquainted with the methods adopted by the surgeon or internist who does. With this end in view, a number of gentlemen particularly capable of writing upon these subjects have contributed to this work.

Dr. A. G. Crofton, the well-known author of "Clinical Urinology" and "Clinical Therapeutics," has written several chapters on the conduct of those internal diseases (excepting those of the nervous system) that involve or are intimately connected with ophthalmic affections.

Dr. D'Orsay Hecht, Assistant Professor of Nervous Diseases in Northwestern University Medical School, has contributed a much-needed chapter on the treatment of such affections of the brain and spinal cord as involve the eye.

Dr. Frank Allport, widely known as an authority on the subject, contributes to the section on Therapeutic Prophylaxis a chapter on the Examination of the Eyes of School Children.

Dr. Nelson Miles Black completes the above sections by a contribution on the Precautionary Examination of the Eyes of Railway and other Corporation Employees.

Dr. H. D. Peterson, Anesthetist to St. Luke's Hospital, Chicago, has written an important chapter on General Anesthesia in Ophthalmic Surgery.

Dr. W. Franklin Coleman, who has long made a study of the subject, has contributed a chapter on the employment of various forms of Electricity in Diseases of the Eye.

Dr. Frank Brawley, whose investigations of the subject are familiar, has furnished an account of the treatment of those diseases of the nose and neighboring cavities that affect the eye.

Dr. Alfred Murray has supplied an entertaining and instructive chapter on the History of Ophthalmic Therapeutics.

Dr. Ernest E. Irons writes on that increasingly important subject—Serum Therapy in Eye Diseases, and its relation to bacteriology, opsonins, the opsonic index, etc.

CASEY A. WOOD.

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Reports of Societies

OPHTHALMIC SECTION, ST. LOUIS MEDICAL SOCIETY.

Meeting April 8, 1908.

DR. A. E. EWING PRESIDING.

Sarcoma of the Orbit.

Dr. John Green, Jr., presented, for Dr. Luedde, a patient previously shown to the section in October or November with sarcoma of the orbit. Since the first presentation Dr. Mudd had done a complete exenteration of the orbit, had made a large flap, and sutured the lower portion of this flap to the cheek, so that the gap was entirely filled in and there was but little cosmetic effect.

DISCUSSION: Dr. Carl Barek doubted whether it was a wise procedure in such cases to entirely close the orbit. If there should be a recurrence, it would be at that site and, in conditions as dangerous as sarcoma, the first object and aim was the preservation of life. When the entire orbit was lined by skin grafts in two weeks' time it would be fairly healed and the orbit was then open to inspection, and in cases of that character the orbit always should be open to such inspection.

Two Cases of Removal of Pieces of Steel from the Vitreous.

By Dr. Carl Barek. The two cases presented have the common feature, that the foreign body entered through the corneo-scleral margin and the root of the iris, without injuring the lens, and that it was extracted in both through a scleral section.

The first case was injured on the 4th of March. The company physician, who saw him first, stated that there was nothing in the eye. Some days later he went to a clinic. Dr. Barek saw him on the 20th. There was a small scar, one mm. long, in the lower temporal quadrant of the corneo-scleral margin, laterally to the end of the vertical meridian. Iris dilated (atropin in clinic) with the exception of a strong adhesion in upper nasal portion. Lens transparent, but a roundish opacity just upon center of anterior lens capsule. This was taken to be an iridic deposit, as mydriatic was used during the first days. The vitreous was cloudy, infiltrated with blood. Fundus just about visible, without details. $V = 3/60$.

Patient was placed before the giant magnet; it caused a sensation of pain. Nothing else. Was sent to Dr. Wells for X-ray picture. Dr. Wells did not get a good picture this day and ordered him for the following day. The next morning, when everything was ready for the operation, the vitreous was somewhat clearer, the

blood having settled down. The ophthalmoscope showed some shine, and the foreign body was located in the outer lower quadrant, close to the bottom, and about in the equatorial region. In narcosis a scleral section was made and the chip was touched by the hand magnet at the first introduction. The click was felt and heard. The foreign body followed the withdrawn magnet. It is about two lines long, with a sharp end. Weight less than 10 mgrs.

This case is presented for two reasons. The healing process was regular; only the mentioned opacity in the center of the lens increased during the first two weeks and had a peculiar appearance. It looked as if there were a number of minute holes in the anterior capsule. Since some days this opaque spot has decreased again in size.

The X-ray picture, which was received three hours after the removal, not only located the foreign body exactly, but Dr. Wells made also a drawing of the size and form of the foreign body which proved to be absolutely correct.

The second case was injured on the 1st of April and seen next morning. A needle of a machine had broken into pieces and one struck the eye. Scar in corneo-scleral margin, outer lower quadrant, slightly below horizontal meridian, irregular, about 2mm. long. Lens transparent. Nasal two-thirds of vitreous clear. Optic disc and nasal half of retina plainly visible. In lower temporal half of vitreous a large hemorrhage, in which a shining whitish body can be plainly seen with the ophthalmoscope. Localization: Not far from posterior wall and about in center vertically. Dr. Barek decided not to try the giant magnet, in order not to injure the intact lens or the ciliary body. Operation at noon in narcosis. Scleral section between inferior and external rectus as in the previous case. After introducing the hand magnet the click was felt, but the foreign body did not follow. He believes that it was caught at once, but arrested by the scleral wall, lying cross-wise behind it. A second introduction of the magnet was not easy, because the conjunctival section was smaller than the scleral one; it was the first time he had substituted a Graefe knife for the wider one he used for years. The second attempt brought the chip into the wound with some choroid in which it was caught, and it was then seized with forceps and fully extracted with forceps and magnet combined. The healing process was normal. The vitreous is now somewhat more infiltrated with blood, but the fundus in part still visible. Vision today 6/36. The piece is about 4 mm. long quite thick and weighs about 50 mgrs.

Specimen of Intra-Ocular Sarcoma.

Presented by Dr. Carl Berek, because it presents a rare type of choroid sarcoma.

The history is briefly as follows: The patient is a gentleman 52 years of age. About a year ago he noticed accidentally that he could not see with his left eye. Was treated somewhere else for detachment of the retina. He consulted Dr. Berek on the 6th of February. Outer portion of the vitreous fairly transparent. In upper nasal quadrant the tumor, which reached close to the lens from behind, could be plainly seen by oblique illumination as well as with the ophthalmoscope. Its sharp circumscribed outlines, considerable projection into the space of the vitreous, want of motion of the overlying retina, made the diagnosis a simple one. The transillumination showed a striking difference when tested from the nasal and the temporal side respectively. Enucleation next morning.

In the upper part, which was used for microscopical sections, the tumor was not in connection with the choroid; this latter lined the sclera and was normal. Also on the portion given around, it seems that the tumor is not adherent to the choroid, whilst it is in connection with the detached retina. As a matter of course there must be a pedicle somewhat further down, as we know only choroidal tumors at the age of the patient. Such roundish, sharply circumscribed choroidal sarcomata are rare; it is the first specimen of this type Dr. Berek has come across. Mostly the sarcomata of the choroid have a broad base and a lobate, cauliflower-like surface. Dr. Alt has seen a few similar specimens.

The section shows that we have to deal with a small round-cell sarcoma. According to the usual terminology it would be called a leuko sarcoma. But also in these a number of pigment cells are invariably found and you find the same in this specimen, especially in and around the blood-vessels, which are quite numerous.

DISCUSSION: Dr. Henry Muetze thought the result as good as he had ever seen. He had reported a case several months ago in which he had removed a piece of steel from the vitreous, but the result had not been nearly as good, especially so far as vision was concerned. The X-ray located the piece of steel very readily and the next day he had removed it under cocaine anesthesia. Three attempts had to be made before it could be removed. In the first two attempts the piece was brought up at right angles to the scleral wound and slipped back. He had read recently of a little

instrument made of aluminum to separate the scleral wound in a case of this kind and it seemed that such an instrument would be of advantage. When this patient was discharged at about the end of a month the pupils were widely dilated. The patient was put in mixed treatment and two months later presented himself with an iridocyclitis. There was pain, sensitiveness to light, and the scar was drawn inward a little. When discharged he had been able to count fingers at ten inches: two months later he could note only the movement of the hand at a distance of twelve inches. He was unwilling to have the eye removed and was sent home with instructions to return if he had further trouble. That was in November and the speaker had not seen him since.

Dr. Ernst Saxl said that the results, when at all successful, were usually very good. He had seen, about three years ago, the best result in such a case that had ever come to his notice. The patient was brought to the office about three hours after the injury. The foreign body could not be located by the ophthalmoscope or in any other way, until it was located by means of the giant magnet. At the second or third attempt the foreign body came out through the opening it had entered. There was scarcely any pain following its removal, and three months later the vision was 6/6 and a complete field.

A Study of the Ocular Manifestations in a Case of Hysteria.

Patient exhibited in conjunction with Dr. S. I. Schwab, by Dr. John Green, Jr. Through the kindness of Dr. Schwab, Dr. Green has been enabled to make an extended study of the hysterical ocular manifestations of this patient.

M. R., aged 32, native of Roumania, came under his observation February 24, 1907. For several months he had suffered severe pain through the temples and bridge of nose. This pain had recently more severe. About three weeks ago he first noticed doubling of objects, diplopia. At first only occasional, but now fairly constant.

The patient's face, except for a slight frown, was peculiarly expressionless. This mask-like aspect was accentuated by a drooping of the lids, slightly more pronounced on the left side. The lids can be raised, but not to their full extent, and the effort at elevation can only be sustained for a few seconds. In consequence, the patient is obliged to throw his head well back in order to see, very much after the fashion of an individual with bilateral ptosis. The facial aspect is very characteristic and has been observed unchanged in all his attacks. On directing the gaze

straight forward, the left eye appears straight, but quickly changes to 10° convergence, with complaint of diplopia. The mobility of each globe is unrestricted in all parts of the field of fixation. On looking up slight vertical nystagmus is developed. A study of the double images seemed to indicate a paresis of the left abducens. Ophthalmoscope showed normal eyegrounds. Form fields were concentrically contracted in moderate degree, O. D. 15 V., 16/12. O. S. 15 V., 16/12.

The case had the appearance of a beginning retrobulbar neuritis associated with paresis of the left abducens. The patient entered the Jewish Hospital in Dr. Schwab's service and Dr. Green did not see him until March 30, 1907, five weeks later.

O. D. V., 3/75; c— 4. sph., 18/75.

O. s. V., 3/96; c— 4. sph., 18/120.

Eyegrounds normal. Fundus details clearly seen with 3 sph. behind mirror (accommodative spasm).

Form field very much contracted, with partial central scotomata, R. and L.

Next observation five months later, August 18th. The improvement in the patient's appearance was so remarkable that Dr. Green did not recognize in him the woe-begone individual of his first two observations. He was indeed the very picture of health. Every trace of his former ocular troubles had vanished.

R. V., 16/12. L. V., 16/12.

Eyegrounds normal: details visible with plus 1 sph. No diplopia. Fields full.

The developments in the case led him to reject his first view of a retrobulbar neuritis and to incline to the diagnosis of hysteria.

The patient was not seen again until January 30, 1908. Through the kindness of Dr. Schwab, Dr. Green has been able to make a more extended study of the case, eliciting various phenomena which can hardly be explained on any but a hypothesis of hysteria. The facial appearance is precisely as on February 24, 1907.

Both orbicularis muscles exhibit frequent slow contraction, especially well marked in the fibres of the lower lids. Narrowing of palpebral fissures, L. and R. The patient can with an effort raise both upper lids, though not to the full extent. If, during this act, the patient be directed to gaze vacantly into space, both globes converge, the right 10° , the left 15° , and diplopia occurs. Pupils equal, light and convergence reactions normal.

R. V., 18-15. L. V., 18-15. Not improved by + or — sph. glass.

The red glass test developed a homonymous diplopia in all portions of the field of refraction, the images remaining at the same level. The separation of the images is least, however, in the right field, and increases progressively as the gaze is carried to the left. With the candle flame at 3 m. the separation of the images to the right is 60 cm., to the left, 150 cm.

Form fields again show concentric limitation. Color fields show a partial inversion, more noticeable R. than L. The field was also plotted on a campimeter at 30 cm. and 90 cm., disclosing the existence of a typical tubular field (Roehrenfomiges Gesichtsfeld).

A searching examination of the fundus (under euphthalmin) failed to disclose any abnormality.

With the left eye screened, an ivory rule held vertically or horizontally at a distance of 3 m. is declared to be doubled (monocular diplopia). The images separated 3 cm. As the rule is brought nearer, the images approach one another and fuse one meter from the eye. With the right eye screened, a similar phenomena is observed. Carrying this test a step farther, the left eye was screened, and it was found that by interposing a vertical prism in such a manner that the base bisected the pupil, a quadrupling of images at once resulted with a prism, base in (similarly placed with respect to the pupil) there occurred a quadrupling of the horizontally held rod.

February 3: V., 18-38, either eye.

A few moments later: V., 18-42 O. D., 18-15 O. S.

O. D. P. p., 16cm. O. S. p. p., 16 cm.

The double images are precisely as at former examination. No monocular diplopia.

This examination appears to have coincided with the subsidence of the attack. As the patient declares that from this time up to February 25th he was not conscious of any ocular trouble. On the later date he resumed his employment (that of painter). While standing on the ring of a ladder two feet up he suddenly felt as if he had received two hammer strokes on the top of his head and fell to the ground. He was probably momentarily unconscious. Immediately he became aware of fogged vision and diplopia.

Examination February 26th.

There is a constant fine tremor of the fibres of the orbicularis.

Both globes are in a position of slight convergence, which becomes more noticeable when the eyes are widely opened.

On attempting to look to the right, the left globe without hesitation passes through a full arc. The right, in the contrary, comes to a stop 15° beyond the median line. If the patient is then urged to exert every effort the right globe resumes its interrupted retroversion and by a series of nystagmic twitches attains a nearly full excursion.

A precisely similar phenomenon is observed in the left eye in the effort at levoversion.

Pupils equal. React sharply to direct, sluggishly to consensual stimulation. Without change in illumination, on convergence effort, both pupils are observed suddenly to dilate and as suddenly to contract, remaining for several seconds motionless in moderate miosis (2 mm.) which is again succeeded by mydriasis.

R. V., 3/75; with —5 sph., 18/75.

L. V., 3/48; with —5. sph., 18/60.

Double images as before.

February 27th:

Screening the left eye, an object is placed on the table to the patient's left. On attempting to pick it up, his hand invariably hovers in the air to the right of the object, *i.e.*, he undershoots the mark. With the right eye screened, an object placed to the patient's right is felt for to the left of the object.

Vision has now gone off to 3/192 O. U.; not improved by any + or — sphere.

March 11th. Visited at Jewish Hospital. Both pupils have now become very sluggish to light. While directing a pencil of light into the eye it was observed that the pupil dilated widely (paradoxical pupillary reaction).

DIAGNOSTIC COMMENT.

The various phenomena considered in detail: First as to vision. This ranged from 16/12 (O. U.), Hyperopia .5 D., to 3/192 (O. U.). That the diminution was due in part to accommodative spasm is evident from the examination of February 26th, when the interposition of a 5 sph. raised vision from R. 3/75 to 18/75, L. 3/48 to 18/60. At this time the fundus details did not become clear until a —5 was placed behind the mirror. On February 27th, when the vision had fallen to 3/192 O. U. —spheres up to 20 D. did not improve. We can not escape, therefore, the idea of a true hysterical amblyopia. Was the partial

ptosis due to paresis of the levators, or spasm of the orbicular muscles? The latter seems the more likely on the following grounds: (1) The presence of fine fibrillary twitchings in the orbicularis fibres: (2) the patient can by a strong effort of the will elevate the lids to some extent, without invoking the aid of the occipitofrontalis: (3) there is no elevation of the eyebrows on separation of the lids.

The question arises, are we dealing with a convergence spasm and spastic strabismus, or with a paresis of the abducens, or with a paresis of the abducens on one side and a spasm of the internus on the other. The behavior of the double images in convergence spasm is characteristic. They have the same separation on looking to the right as when the patient looks to the left. But in the present case, homonymous diplopia, present in all parts of the lateral field, is least to the right and increases progressively as the object is carried to the left. On the other hand, there is hardly any limitation to outward movement of either eye, when the patient is urged to do his best. Confirmation is furnished by the greater rapidity and range of the primary version to the right of the left eye, and vice versa. Let it be remembered, also, that with one eye screened, the patient undershoots an object situated within the field of action of the affected muscle. The reason for this, as stated by Duane, is, "that the patient underestimates the distance that the eye travels, since he is aware only of the effort that he is putting forth in order to look at the object, and with an overacting muscle this effort is less than normal."

All things considered, Dr. Green believes that the condition is one of true convergence spasm, possibly associated with paresis of the left abducens.

Monocular diplopia was observed only during accommodation spasm. The basis of this phenomenon, according to Parinaud, is a spasm of the ciliary muscle. If the spasm is complete, the eye is adapted for a fixed point. On either side of this fixed point diplopia appears, as the result of structural defects in the crystalline lens. De Schweinetz quotes Parinaud as follows: "The disposition of the anterior portion of the lens in three segments favors its changes in curvature, but at the same time, owing to their separation from one to another by layers of amorphous material, each section possesses a focal point of its own, capable of producing images distinct from that yielded by the lens as a whole. The condition of spasm by increasing the convexity of the anterior surface of the lens, serves to emphasize the diplopia

arising from the structural defects described. Pirere Janet believes that occasionally this phenomenon is to be ascribed to psychic origin.

In the present case the doubling of the double images (quadrupling of images) lends support to the theory of Parinaud.

Other phenomena described in the report—contracted fields (on one occasion with partial central scotoma), partial inversion of the color fields, the presence of tubular fields and the paradoxical pupillary reaction—are mentioned as points of evidence in support of the conception of the essentially hysterical nature of the ocular phenomena.

BRITISH MEDICAL ASSOCIATION.

Meeting held at Sheffield, July, 1908. Section of Ophthalmology. Sir Henry Swanzy, F. R. C. S. L. President, in the chair.

The relation of Disease of the Nasal Accessory Sinuses to Disease of the Eye.

The discussion on the Relation of Accessory Sinus Disease to Disease of the Eye was opened by Dr. George Mackay (Edinburgh), and previous to his paper a demonstration on the anatomy of the parts was given by Dr. Logan Turner.

Dr. Mackay said that during the past 30 years, but more especially in the past decade, there has been put on record in ophthalmic and rhinological literature much evidence which goes to prove not only that a large proportion, perhaps the majority, of cases of idiopathic orbital cellulitis and of orbital abscess have their origin in diseases of the nasal accessory sinuses, but also that a considerable number of maladies affecting the textures of the eyeball and its appendages in a more solitary manner may at times be traced to the same source, as direct or as reflex disturbances. In view of the fact that the references to this literature in our text-books on Diseases of the Eye are as yet very scanty, he might perhaps here be permitted to mention in passing his indebtedness to the Monograph of Eversbusch, published in 1903, and to the later contribution by Birch-Hirschfeld on Diseases of the Orbit (1907) which forms part of the ninth volume of the slowly appearing second edition of the *Handbuch of Graefe-Saemisch*. The patient researches of Onodi have added largely to our knowledge of the anatomical peculiarities of these parts, and in his recently published work, "*Der Sehnerv und die Nebenhöhlen der*

Nase" (1907) he has brought together also a large number of clinical references of the highest value to every student of this subject. Time did not permit him to refer here to many briefer communications which have appeared within recent years. To some he would have occasion to refer later. In the meantime he would only add that he felt sure many of us are indebted to the editors of *The Ophthalmoscope* for the attention which this subject received from them in the April number of that journal.

To facilitate discussion it was proposed to submit for consideration the chief ocular and orbital disorders associated with sinus disease, arranged in certain groups, which, if not very precise, might be clinically convenient.

Group I. Mucocoeles of the Accessory Sinuses.

Group II. Sinusitis, acute or chronic, accompanied by obvious external signs of orbital cellulitis, abscess formation, tumor growth, oedema of lids or apparent dacryocystitis.

Group III. Sinusitis without external signs of inflammation in the orbit or neighboring tissues, but

(a) With ophthalmoscopic signs, such as optic neuritis, neuroretinitis, retinal thrombosis, or phlebitis, etc.

(b) Without ophthalmoscopic signs but with disturbances of vision, such as central scotoma or limitations of the field of vision, paralysis of ocular muscles, or disturbances referable to the fifth nerve.

Group IV. To this group may be relegated cases in which the association with disease of the sinus has been asserted, but was more questionable.

It is doubtful whether the *antrum* or *frontal sinus* is sufficiently developed in very young children to permit of a mucocoele forming in either cavity in early life.

Opinions differ as to the *relative frequency* of frontal and ethmoidal mucocoeles. Accurate statistics are wanted and if forthcoming today will be welcome.

Pain and tenderness are usually slight or absent.

Swelling in the affected region is the most prominent sign, and there is often no visual disturbance unless it be diplopia.

The essential *treatment* must be surgical, and to what is already stated in the synopsis he would only add that he had invariably transferred his cases to a rhinologist because their radical cure appeared to him to involve endonasal methods which he did not practice. Some of his cases were published by Logan Turner.

There may, however, be present today colleagues who will find in this group points worthy of discussion, but the succeeding groups appear to him to be more attractive.

Group II. Sinusitis, acute or chronic, accompanied by obvious external signs of orbital cellulitis, abscess formation, tumor growth, oedema of lids or apparent dacryocystitis.

Acute cases were characterized by more rapid onset of symptoms, more pain and tenderness at the seat of the affected sinuses, and in some instances general pyrexia, but the diagnosis was based on lines similar to those described in chronic suppuration, and he had refrained from preparing a separate chart which would involve much repetition.

While empyema of the antrum is probably of more frequent occurrence than any other, it was almost certainly not the most frequent cause of orbital complications. There appeared to be hardly any reliable statistics available either as to the relative frequency with which orbital abscess arose from sinus disease as compared with other causes, or as to the order of precedence of the sinuses in the frequency of its production.

Birch-Hirschfeld* has recently stated as the result of a careful analysis of the records of the Leipzig Eye Clinique that out of 684 cases of orbital inflammation, no less than 409 (59.8%) were due to accessory sinus inflammation, and he suggests that the number would probably have been still higher if the nose and accessory sinuses had always been examined. In 129 cases (29.8%) the frontal sinus was the starting point of the disease; in 89 cases (21.8%) the maxillary sinus; in 83 cases (20.5%) the disease started from the ethmoidal sinus; and in 25 cases (6.1%) from the sphenoidal sinus. In 60 cases (14.7%) several sinuses were affected, thus 25 times both frontal and ethmoidal suffered together, 12 times ethmoidal and maxillary, and 10 times ethmoidal and sphenoidal were associated.

There was room for discussion, and information was desirable as to the way in which the inflammation was conveyed from the sinus wall to the orbital contents.

Some might wish to discuss today the best means of arriving at a differential diagnosis between cases of orbital cellulitis arising from sinus disease and those due to other causes, for instance, tubercular and syphilitic periostitis. The appropriate treatment might also engage attention.

But empyema might be present and yet give no outward and

*Klin. Monatsbl. fuer Augenb., Jan., 1908, p. 3.

obvious suggestion of its existence. There might be no definite nasal complaint, there might indeed be denial of nasal symptoms, And when even trained rhinologists cannot always make us assured of its presence or absence, or can only develop their convictions after repeated examinations, it was not much to be wondered at that ophthalmic surgeons in the past had often failed to attribute to sinus disease cases which were only characterized by visual disturbances with or without ophthalmoscopic changes.

The most interesting and varied cases were to be met with in the next group—*Group III*—Sinusitis without external signs of orbital inflammation, but (a) with ophthalmoscopic signs, such as optic neuritis, neuroretinitis, retinal thrombosis, or phlebitis, etc. The anatomical relations and the vascular connections of the nasal cavities with the nerves and blood vessels about the apex of the orbit made it easy to explain such occurrences, and the Monographs which he had already cited adduce either within their own texts or in their literary references abundant clinical evidence.

That such cases did occur was beyond dispute, but we had much to learn about them. Just as in the past we had been inclined to attribute orbital cellulitis to periostitis and had paid little regard to sinus disease, so here we had probably overlooked this cause through failure to examine for it systematically.

There was also a considerable mass of evidence justifying the recognition of the second division of this group (*Group III, b*), namely, cases of sinusitis without obvious external disease and without ophthalmoscopic changes, but with disturbances of vision, such as central scotomata or limitations of the field of vision, paralyzes of ocular muscles, or disturbances referable to the fifth nerve.

Mendel, Jessop, Fuchs, Paunz, Delneuve, Birch-Hirschfeld, Posey and Hill Hastings had reported cases of central scotoma, presumably due to retrobulbar neuritis in association with disease of the posterior sinuses, and in some instances the malady was relieved by operation, while in others relief came too late but pointed the moral. Careful and precise observations on the exact limitations of the field of vision in well authenticated cases of sinus disease were much to be desired.

In addition to paralyzes of ocular muscles and neuralgias relieved by sinus treatment, another interesting association had been found in the occasional occurrence of glaucoma. De Laperousse, Paquet, Germann and Fish had drawn attention to some cases. Birch-Hirschfeld mentioned two in his Leipzig analysis,

and he, Dr. Mackay, had recently had one under his own observation in a case of antral empyema.

In Group IV he proposed to include, at least temporarily, ocular affections in which the nasal connection had not been so clearly established. It had been asserted that affections of the cornea (Ziem and Kuhnt), of the iris, of the choroid, and that opacities of the vitreous as well as of the lens might sometimes be traced to the same source of contamination. In short, it would appear that there was no part or function of the eye whose good manners may not be corrupted by evil communications from the upper respiratory passages.

But if this were true, only in part, it is evident that every ophthalmologist ought to have some training in rhinology or would need to assume a rhinological partner. In the first place, however, it is clear that much conjoint work would be required before specialists in either department could diagnose these cases with confidence by their associated signs and symptoms, or be able while recognizing these as concurrent to correctly appreciate their possible independence.

Today's discussion will doubtless bring forth some expression of opinion also as to the relative position of rhinologists and oculists in the surgical treatment of these cases. Dr. Mackay said he was aware that in this assembly there were some surgeons who practised in both departments, and we should look to them for valuable counsel. In this connection he could not close without drawing attention to Birch-Hirschfeld's paper in the January number of the "*Klinische Monatsblätter für Augenheilkunde*," and to the very interesting rejoinder by Professor Axenfeld in the May number of the same journal, advocating that ophthalmic surgeons should interest themselves more in the surgical treatment of orbital and sinus affections. But he need not enlarge upon this point for they had the good fortune to have Professor Axenfeld there that day and they would hope to hear him expound his views in person.

Dr. St. Clair Thomson (London) said that the causes of thrombosis of the cavernous sinus were chiefly found in disease of the nose and ear, but the symptoms being so obvious in the eye, they usually came under the observation of the ophthalmic surgeon. The most likely cause of these cases was suppuration in the accessory cavities of the nose; while suppuration in the ear was nothing like so frequent a cause. Infection was very likely to take place through the veins running into the orbit. The sphenoidal

sinus being in the most intimate relation with the cavernous sinus, inflammation might easily pass from it to the sinus, for in such cases the bony wall might be reduced to the thinness of paper, or might even have physiological defects in it. Inflammation was able to readily pass from one cavernous sinus to the other by means of the circular sinus. It followed, therefore, that inflammation of the sphenoidal sinus was the most likely of any to produce thrombosis. Next to this pyogenic affections of the ear were the most common. Thirdly, there were the cases in which infection took place through the ophthalmic vein, while he placed infection through the pterygoid plexus last.

The chief characteristic symptoms were usually connected with the eye, and there might be coexisting meningitis, pyogenic temperature, rapid pulse, rigors, headaches, sickness, delirium, coma, swelling of the palate, etc. The three chief eye symptoms were papillary oedema, chemosis and exophthalmos, and these developed from 6-16 days from the onset of symptoms. Paralysis of the ocular muscles was generally present. The condition of the pupil varied. The vision may be good or blindness might rapidly supervene; there might also be tenderness of the eyeball. He showed numerous photographs and diagrams illustrating his cases.

Mr. Sydney Stephenson (London) described a case of thrombosis of the cavernous sinus. The patient was a man aged 27. For several years he had had thick discharge from the nostrils, with secondary infiltration of the larynx, and later on pus was found in the right ear. The right nostril was bathed in pus and blocked with polypi, and he had a nodule on the left vocal cord. The patient became very ill and both eyes became proptosed, and the conjunctiva chemosed, the retinal veins were grossly distended and the arteries small, the discs were hazy but definite papillitis could not be said to be present. Thrombosis of the cavernous sinus was diagnosed, and a bad prognosis given. The patient became worse and developed various abscesses and was suffering from pyæmia, and he died after an illness of about 23 days. At the *post mortem* pus was found covering the surface of the brain and a large amount lay beneath the right frontal lobe. Pus was present in the cavernous and circular sinuses and a thrombosis extended from one cavernous sinus to the other, there was also pus present in the right orbit, the sphenoidal and ethmoidal sinuses. The conclusion arrived at was that infection had spread from the ethmoidal and sphenoidal sinuses, and had set

up a septic meningitis associated with pyæmia. Pneumococci and staphylococci were found to be present.

Dr. W. S. Lyme (Glasgow) said that it was surprising that only recently was the connection between sinus and eye disease brought into prominence. Most interest now attached itself to relationship between diseases of the posterior group of accessory nasal cavities. From the examination of skulls he quite bore out all that had been said by Dr. Turner, and what Onodi had demonstrated, that we might get any variation in the relation of the sphenoidal sinuses to one another, to the posterior ethmoidal cells and to the nerves, sensory and motor, in connection with the eye. He had found in one specimen an extension of the sphenoidal sinuses practically surrounding both optic nerves, and the bone was reduced to the thinnest possible layer. He thought that as a rule the path of infection was indirect rather than direct, and that the cellular tissue surrounding the internal carotid was a factor. This became infected from the sinus and the inflammation then spread along vessels and involved the perineural covering.

Mr. Arthur Greene (Norwich) described a case of disease of the left ethmoidal sinus in a boy aged 8, who while suffering from scarlet fever and diphtheria had had a lump opened near the inner canthus four years before. It remained quiet until a month before Mr. Greene saw him, when it again became prominent. On opening it, a quantity of mucus was evacuated. The cavity was well curetted, but it had not become obliterated. The points of interest were the age of the patient, its connection with diphtheria, and the fact that had the cavity been drained into the nose from the first, probably no wound would have been made on the surface, but further operation was refused. A radiograph showed that the frontal sinus was not involved.

Professor Axenfeld (Freiburg) said that in order to arrive at a proper estimate of the importance of the cases, we must recognise the fact that acute affections of the sinus may sometimes heal spontaneously by evacuation through the natural passages, while orbital disease may persist and increase because the cavity is a closed one. We may thus not always find the sinus which first gave rise to the disease in an abnormal state. He described a case illustrating this. Diseases of the sphenoidal and ethmoidal sinus cavities might cause compression and inflammation of the optic nerve, and it was expected at one time that acute retrobulbar neuritis might be so explained. At first it appeared not to be so, until it was realized that the sphenoidal and deepest eth-

moldal cells might escape observation during nasal exploration, although they may have caused the trouble, particularly in cases in which the cavities were not separated by bone from the sheath of the optic nerve, which does occur at times.

Dr. Bronner (Bradford) said that everyone saw cases of headache only partially relieved by glasses, and in many of these some disease of the nose was present, and these people were particularly liable to complain of drowsiness after reading, and inability to remember what they had read. The most dangerous cases were those of suppuration of the sphenoidal sinus, in which there was not free drainage, and these cases often gave rise to disease of the cavernous sinus.

Professor Fuchs (Vienna) said that in some cases of ethmoidal and sphenoidal sinus disease causing orbital disturbance, nothing was to be made out by simple inspection of the nasal cavity, but if the symptoms were sufficiently urgent these sinuses should be opened from the nose and in some cases they would be found filled with pus or granulation tissue.

Dr. A. Logan Turner (Edinburgh) in his reply said that he wished to draw attention to the question as to whether the rhinologist was justified in opening one or more sinuses in order to exclude the possibility of sinus disease. He would at least like the assurance of the ophthalmologist that all other causes of ocular disease had been excluded. As regards treatment, the simple way of merely opening it led to septic infection of the sinus and a permanent fistula. If the sinus was not obliterated by extensive removal of the bony wall, then through drainage of the cavity into the nose was essential, and this should only be done by one thoroughly acquainted with the anatomy of the nose.

Dr. Mackay in reply described a case of sinus thrombosis and meningitis arising from infection along the frontal and ophthalmic veins due to anthrax. He urged the further study of seotomata associated with sinus disease and gave details of a case of glaucoma associated with unsuspected antral suppuration.

Monocular Diplopia.

W. B. Inglis Pollock (Glasgow) read a paper on Monocular Diplopia.

He said that cases arising from optical conditions in the anterior segment of the eyeball might be separated into two groups, the first with double pupil and the second where irregular refraction by the cornea and lens produced two or more images on the

retina (monocular polyopia). The first group included such conditions as a band passing across the pupil whether congenital in origin, or due to inflammatory processes, or the condition of iridodialysis. In these cases diplopia only occurred if the object were out of focus for the eye. Among the second group were a number of varied affections. The lens when dislocated so that the edge passed across the pupil always caused monocular diplopia. Both images were out of focus, the one formed through the margin of the lens, was as if myopic, while the other due to the aphakic condition resembled hypermetropia.

Irregular corneal refraction from old superficial ulceration occasionally gave rise to diplopia, but generally of an indefinite character. It was more persistent than some of the other forms.

That due to irregular lenticular astigmatism was comparatively rare, except when due to incipient cataract. The author had had a case in a child with congenital cataract. Irregular lenticular astigmatism also explained a case of diplopia occurring in ophthalmoplegia interna in a man of 30. The diplopia had persisted to the present time since first observed four years ago.

The question of the possibility of the retinal origin of monocular diplopia was most interesting. Costentin reported a case where diplopia occurred as the result of detachment of the retina the entire upper portion of which was applied to the lower half of the retina, the latter still being *in situ* and the light thus affecting two portions of the retina at the same time.

The author's case was a woman with double choked disc. She had diplopia in one eye during the early stage of regression of the œdema: and he advanced the theory that the diplopia was due to a shrinkage of the retina, which caused slight wrinkling of the layer of rods and cones at the macula. Light converging to a focus would then affect two neighboring regions and so produce the diplopia.

Glaucoma in Consequence of Cicatrix of Cornea with Anterior Synechia.

Professor E. Fuchs (Vienna) read a paper on Glaucoma in consequence of cicatrix of cornea with anterior synechia (leukoma adherens).

He stated that in cases of ulcer of the cornea before perforation, the angle of the aqueous chamber was open, although often filled with lymph; only very exceptionally the swelling of the adjoining tissues might bring the root of the iris in contact

with the ligamentum pectinatum in places. After perforation, as long as the aqueous chamber was absent, the iris was applied to the cornea and adhesion might ensue, if the endothelium were stripped off. When the aqueous chamber was re-established, the iris was pulled from the cornea chiefly by the action of the sphincter pupillae. Where the anterior synechia was present, the sphincter was inactive and therefore the root of the iris remained attached to the back of the cornea corresponding to the site of the anterior synechia, whilst the angle of the aqueous chamber was patent in all other parts. In a small number of cases, however, the angle remained obliterated, the iris being applied to the posterior surface of the pectinate ligament up to the margin of Descemet's membrane, but the root of the iris preserved its normal condition and was not compressed and thinned, if one considered only cases without increase of tension. Obliteration of the angle of the aqueous chamber with normal tension might be brought about, either by the obliteration not being really circular, but being absent in certain places, which had still to be elucidated by the examination of serial sections, or the peripheral synechia not effectually impeding the outflow of the aqueous humor, as long as the iris tissue itself was normal, the aqueous passing into the iris by the crypts, and from the iris into the pectinate ligament.

Dr. W. B. Inglis Pollock (Glasgow) said he had an opportunity of examining three cases with attachment of the pupillary margin of the iris to a small central cicatrix, when the cornea showed no ectasia, nor was the tension raised. In these cases the periphery of the iris was adherent to the cornea beyond Descemet's membrane in the manner described by Professor Fuchs. Although not carrying out serial sections he was able to see on the opposite side that the angle of the anterior chamber was open, and that was sufficient for keeping the tension normal.

Dr. Craig (Belfast) referred to a case with a synechia only 0.5 mm. wider between the periphery of the iris and the cicatrix of a cataract extraction incision. The extraction was done after a preliminary iridectomy and the vision of 6/6 and J1 was obtained. A year later the vision slowly failed through increased tension with cupping of the disc. The question was whether the small synechia was the cause of the glaucoma.

Discussion on Serum Therapy.

The "discussion on Serum Therapy" was opened by Professor Vonfeld (Freiburg). He stated that like all new forms of treat-

ment it had evolved over-sanguine expectations on the one hand, and exaggerated skepticism on the other, and he endeavored to set before the section the true position it occupied. He referred in eulogistic terms to the excellent review of the subject by Percival Hay, which had recently been published in "The Ophthalmoscope." In obstinate cases of blepharitis and hordialo, staphylococcus vaccine from the patient himself made according to the directions of Wright might prove useful. Serum therapeutics should be tried in cases of corneal and intraocular infection as an adjunct, but in virulent infections, especially in acute cases, they would not alone be powerful enough. The good effect of diphtheritic antitoxin was so well known that it was unnecessary to dwell upon it, but it must be remembered that mixed infections were frequently present. It was doubtful as to how far post-diphtheritic paralysis was influenced by serum; observers differed in their opinions; but it should be remembered that with the serum treatment severe cases recover which would certainly die if it were not used.

Serum should be used not only as a treatment, but as a prophylactic against tetanus.

Dunbar's "Pollatin," made from the pollen of grasses, could be applied with good results in cases of hay fever. Weichart denied the antitoxin character of this serum and made another called "Graminol," and Professor Axenfeld had found both useful in certain cases but not in all, and the result was often permanent.

To the antitoxin therapeutic agents belonged Roemer's Jequiritol serum to arrest violent Jequiritol ophthalmia. A strong reaction was essential, but it might become dangerous. He thought that better results might be obtained by subcutaneous injection of the antitoxin instead of simply instilling it into the conjunctiva, as most observers had done. The unpleasant complication of dacryocystitis might be avoided by injecting it into the tear sac, and this did not influence the reaction of the conjunctiva.

Much greater difficulties were encountered in using serum against those bacteria which did not produce free toxins, as here the question is how the bacteria are to be rendered innocuous or killed.

The pneumococcus was the most dangerous form of organism. The pneumococcus serum hitherto prepared by Roemer and Merck did not yet fulfill the high therapeutic requirements necessary for the treatment of serpiginous ulcer of the cornea: the serum possessed more curative properties but did not take the place of

surgical treatment entirely. The sub-cutaneous injection of dead pneumococci did not prove so efficacious.

As hypopyon keratitis and wound infection of streptococci were relatively rare, no great experience of serum therapy had yet been obtained, and no sufficient researches had yet been made regarding staphylococci, but Professor Axenfeld was still engaged in investigating these.

Prophylactic serum from the patient himself who was suffering from blepharitis, conjunctivitis, etc., should be used before undertaking an intraocular operation, when these septic conditions were not amenable to treatment. For some organisms this was relatively easy, such as for staphylococci, but with pneumococci it was far more difficult, as if cultivated from the eye they displayed but slight virulence. In spite of this, however, they might produce wound infection if they entered the eyeball. Less was to be expected from serum in cases of acute purulent wound infections, although some good results had been experienced. In cases of acute purulent wound infection, the passive immunization with an efficient serum should always be considered the best, but the fulfilment of this was often impossible owing to the fact that a suitable serum could not always be obtainable, and sometimes it was possible to use a combination of one or more sera. The metastatic eye infections would be more likely to be influenced by serum than the acute. He then discussed the treatment with tuberculin.

In cases of sympathetic ophthalmia some observers have obtained good from the serum of a patient suffering from the disease, but Professor Axenfeld's experience was that it was negative in the cases he tried it on, and theoretically the prospects were not very good.

In diplobacillary infection it would not be worth the trouble of preparing a serum, for zinc salts do all that is necessary. In trachoma also it would be of very doubtful utility.

Some people, such as Darier and Deutchmann, assert that as good or better results may be obtained for new specific serum therapy, and they assert that the antidiphtheritic, antitetanic and yeast serums act against all kind of infection, but this is by no means proved. The necessity for experiments on animals is paramount in working at this subject, and although the results can not all be at once transferred to man yet there is great agreement in many cases and they are of the greatest possible clinical value, but the question of the non-specific serums is by no means settled as yet. He gave details of Deutchmann's experiments with yeast

passed through horses, but was by no means convinced of the favorable deductions he had drawn from his experiments.

He stated that up to the present time a very high standard of excellent had been maintained in dealing with these subjects, but he raised a note of warning lest this should be lowered, and the results obtained in other parts of the body was not sufficient for us, for we could only rely on experiments on the eye itself.

Mr. Percival J. Hay said that in going over the literature of serum therapy he was struck with the want of critical faculty in finding results, and he thought that great reserve should be exercised in forming any views as to the value of any one serum. He thought it open to question as to how far the results of Deutchmann and Von Hippel could be attributed to the serum used.

Mr. Bishop Harman (London) said there were two classes of cases in which successful serum therapy could be of the greatest value, the membranous conjunctivitis due to the staphylococcus, and the other variety was the chronic form of irido-cyclitis. The first was too rapid to be able to obtain successful serum from, and as regards the polyvalent serum he thought it savored of the universal quack remedy. With regard to the second class, he had treated them with tuberculin, but had had vastly superior results from the more homely treatment of fresh air in a bracing seaside sanatorium.

Dr. Inglis Pollock (Glasgow) said that non-specific sera required careful testing and a solitary brilliant result was not of much value, especially when dealing with hypopyon ulcers, many of which would clear up under mild antiseptic treatment. He did not put much value on the cure of metastatic gonorrhoeal cases, as these were almost invariably of a mild type.

Dr. Hern (Darlington) had used a multivalent serum in a number of cases, but so far without any definitely good result; this was possibly due to our want of knowledge as to what we are dealing with, and to the possibility of one serum neutralizing the other. He was convinced of the great utility of antidiphtheritic serum in cases of diphtheritic ophthalmia.

Professor Ernst Fuchs (Vienna) had not conducted experiments himself. In his clinical experience the successes he had had were never so marked as to put it beyond doubt that the serum had brought this about. He agreed with Professor Axenfeld that it was by experiment only that the efficiency of a serum could be really tested.

Mr. Arthur W. Ormond (London) had used the Jequiritol

treatment in cases of dense corneal opacities, and when a sufficient reaction had been produced he had used the anti-Jequiritol serum. He was much impressed with the rapid and complete subsidence of the artificially produced inflammation, a result which convinced him of the efficacy of the serum.

Professor Axenfeld briefly replied.

Filtering Cicatrices by Two Methods.

Colonel H. Herbert showed eight glaucomatous eyes which had been operated upon by the "wedge-isolation" method, and two in which tension had been relieved by a form of sub-conjunctival paracentesis. The communication dealt chiefly with the former operation. Sixty-three primary glaucomas had been treated by this method. Though only about a third of them had been under observation for more than six months afterwards, probably sufficient indications had been given of the final results as regards tension in practically all of the cases. In two cases incomplete reduction of tension had necessitated repetition of the operation, and in one other case there had been some return of tension, apparently only temporary. Another eye had been made much too soft for a time by the formation of a wide fistula, but the tension had risen again to about —1 and the vision had improved a little. Other fistulae which formed had not reduced the tension excessively. And in the majority of the cases the reduction had been brought about without any visible fistula. Filtration was shown merely by conjunctival oedema and by complete relief of tension, with retention or improvement in vision.

The details of the operation were described minutely, and the precautions emphasized which were necessary to avoid the formation of a wide fistula, on the one hand or imperfect relief or tension, on the other hand.

It was admitted that the performance of the operation required much more care and attention to detail than Legrange's, but it was thought that better and more uniform results could be attained by it. Variations from the typical result appeared to be due solely to easily recognizable faults in technique, and should therefore prove to be preventable.

A case of chronic simple glaucoma was shown in which apparently permanent filtration had been produced by sub-conjunctival paracentesis. The field of vision was extremely contracted, and the fellow eye blind, so that any larger operation had not appeared justifiable, though the vision was thought to be deteriorating

under treatment by eserine drops. From experience of this operation upon absolute glaucomatous eyes, the resulting filtration was found to be limited. And the operation did not seem to be indicated for the preservation of vision in ordinary glaucomatous eyes.

Major H. Smith, I. M. S., said that Colonel Herbert admitted that his object was to establish a permanent sub-conjunctival drain and the results he showed were excellent, but there appeared to be no permanent drain and the result seemed to be due to a temporary drain followed by a hard non-filtrating scar. He thought it more probable that the explanation of the good result was that the temporary drain allowed the physiological equilibrium to be re-established; still he had an open mind on the subject and said he would try the operation. He had seen many permanent sub-conjunctival drains follow operations and usually these eyes had become soft and the retina atrophied and he personally felt disposed to avoid a permanent drain. He thought the operation should be done open, the conjunctival flap completely cut, and the portion of the sclerotic should be exercised; a conjunctival flap was, of course, essential.

Colonel Maynard, I. M. S., congratulated Colonel Herbert on his excellent results, although opinions differ as to how these were brought about. The difficulties of the operations which appeared to be great on reading the description was really far less in practice. The peripheral iridectomy was omitted in some cases which showed good results, and he thought that these cases only should be taken account of in considering the merits of the operation. He had performed Lefrançois's operation a few times, but experienced difficulty in knowing how much sclerotic he should remove. Possibly the use of Vacher's scissors would insure a more even sclerotomy.

Mr. Whitehead (Leeds) asked whether any long series of cases had been reported. He had done about twenty consecutive cases by Lefrançois's method with good results. His impression was that large iridectomies gave the best results, and until a large number of cases had been reported he thought it impossible to compare the two methods.

Color Vision and Its Anomalies.

The discussion on "Color Vision and Its Anomalies" was introduced by Dr. F. W. Edridge Green. He divided cases of color-blindness into two classes, which were distinct from each other, but

both of which might be present in the same person. In the first class there was light as well as color loss. In the second, the perception of light was the same as in the normal sighted, but there was defect in the perception of colors. In the first class certain rays, such as the dark red rays, were not perceived at all, or were very imperfectly seen. Color-blind persons belonging to the second class could be arranged in series. At one end were the normal sights, and at the other end the total color-blind; and the others he arranged according to the number of colors they saw in the spectrum. Thus, the normal sighted who were able to see six colors he designates as hexochromic; those who saw five, pentachromic; those who saw four, tetrachromic; those who saw three, trichromic; those who saw two, dichromic, and the totally color-blind, monochromic. There were many degrees in the dichromic. There might or might not be a neutral band separating the red and violet colors of the spectrum, and the wider this neutral band, the greater was the degree of color blindness. The tests he used were three in number: (1) The lantern; and he showed two varieties he had introduced for this purpose. (2) The classification test, which consisted of colored wools, silks, cards and glass. (3) The spectroscope. In all these tests the candidate was required to know the names of the primary colors, red, yellow, blue and green, and matching was not employed. In the spectrum test the examinee was required to point out the commencement and the termination of the spectrum, to designate the various colors, and show, by a special apparatus, the size of the different portions of the spectrum which appeared to him to be monochromatic.

Dr. Cecil Shaw (Belfast) said he had been examining a number of students by both Holmgren's and Edridge Green's tests, and, though he had not examined a sufficient number to enable him to come to any conclusion as to the comparative merits of the tests, he thought that the proportion of color-blind found among the educated classes was much less than was generally given in books.

Mr. Devereux Marshall (London) said that Dr. Edridge Green was much to be congratulated on the excellence of his work, and for devising such excellent tests, which were far the best ever employed. He did not at all agree with Dr. Cecil Shaw in thinking that educated persons were less color-blind than uneducated ones, for given a case of color blindness it was impossible ever to really improve them, although by education crowds of them could pass the Holmgren test perfectly, and thus deceive the examiner, if this was the only test he relied on.

Major W. S. Pridmore, I. M. S., wished to thank Dr. Edridge Green for his excellent paper, and he also asked if color blindness was more common among the uneducated. In India particularly he had felt the need of a simple test. He had passed scores of natives for railway and marine service by the matching test alone.

Lieutenant Colonel Maynard, I. M. S. (Calcutta), said that some aboriginal tribes in India had only names for two or three colors, and therefore matching tests for them were a necessity. Investigation of the colors recognized and named by such people might lend support to Dr. Edridge Green's theory.

Mr. Tomlinson (London) laid stress on the value of a projection spectrum over that seen in an ordinary spectroscope. He described and showed a lantern he had designed for giving a projected spectrum in the consulting room. Any part of the spectrum might be completely isolated by means of shutters, or any of the colors might be mixed.

Dr. Edridge Green, in reply, said that Mr. Tomlinson's projection spectroscope was most ingenious and useful. As regards the question as to whether educated persons were less color-blind than uneducated, he was quite certain they were not, but the tests in common use were so very bad that large numbers of normal-sighted persons, especially the ignorant ones, were considered to be color-blind, when in reality this was not so; and in addition vast numbers of educated color-blind persons who were not too grossly color-blind could readily pass the Holmgren test, and it was this which gave rise to the false impression mentioned by Dr. Cecil Shaw. He thought that as no matching test was of the least value it was absolutely necessary that color names should be used, no matter how savage and ignorant certain races might be. If such people were to be employed, as Major Pridmore said, for railways and marine work, it would be impossible for them to work signals unless they did know the names of the primary colors; and if they could not be taught them it was quite certain they were mentally unfit to take charge of machinery.

Glycerine as an Adjuvant to Silver Nitrate.

Mr. N. Bishop Harman (London) read a note on the use of "Glycerine as an Adjuvant to Silver Nitrate." He commented on the various albuminoid preparations of silver which chiefly held their sway owing to the fact that they caused less pain on application than nitrate. He had found the following far less painful than a simple watery solution. To a half, one or two per cent of silver

nitrate in distilled water he added fifteen per cent of pure glycerine. This raised its specific gravity and greatly increased its penetrating power. It was distinctly less painful and more efficient than the ordinary solution. He colored the solution by a trace of rose aniline.

Hollow Spear-Headed Needle for Tapping the Anterior Chamber.

Mr. Bishop Harman also showed a "Hollow Spear-headed Needle for Tapping the Anterior Chamber." By this instrument a certain amount of aqueous could be withdrawn absolutely free from contamination. The figure shows the shape and form of the needle, to which a syringe could be attached.

Fastening Spectacle Frames on Infants.

Mr. Bishop Harman also demonstrated a convenient mode of "Fastening Spectacle Frames on Infants." Spectacles were a necessity for some infants in the treatment of squint. Curved sides could not be used, as they would have to be so stiff as to be impracticable. The usual plan was to tie them behind the nucha with tape or elastic, and this usually produced abrasions of the nose and the top of the ears. His method completely avoided this. A piece of tape or elastic was looped under the nucha, its ends threaded through the eyes of the spectacle bows, then curved into the vertex, where they were tied together. This circuit of tape held the spectacles firmly in position, yet allowed sufficient elasticity to avoid pressure on the nose, and the bows were not dragged down on the top of the ears. He preferred this to curled sides for children under 7 years of age.

Anatomical Factors Bearing on the Pathogenesis of Glaucoma.

Dr. Thomson Henderson (Nottingham) read a communication on "Anatomical Factors Bearing on the Pathogenesis of Glaucoma." He said that primary glaucoma was the component of two factors, the first constant and brought about by the physiological sclerosis of the cribriform ligament, and the second variable and vascular. The sclerosis of the cribriform ligament diminished the outflow through Schlemm's canal, and threw a greater proportion of the work of drainage on the iris crypts and veins. If the crypts were not equal to the work, then the tension slowly and impalpably rose—chronic non-congestive glaucoma. The inter-ocular fluids (vitreous and aqueous) transmitted pressure equally in all directions, and therefore when their exit was diminished and tension rose,

the whole elastic intra-vascular system tended to be converted into a rigid one. Hindrance to the free exit of aqueous through Schlemm's canal could not be the cause of the deepening of the anterior chamber in either "serous" cyclitis or simple glaucoma, as with a free and open pupil the pressure in the anterior chamber could not rise above that in the posterior aqueous chamber, in which too the aqueous was found. In pathological, as in physiological states of the intra-ocular tension there was pressure discontinuity within the globe of the eye. In an eye with a tendency to glaucoma, *i. e.*, with a sclerosed cribriform ligament, and therefore diminished range of outflow, a congestive glaucomatous onset would be precipitated by any conditions which could cause:

(1) Dilatation of the pupil and so closure of the iris crypts, the sole remaining aqueous outlet.

(2) Rise in arterial pressure, which raised the intra-ocular tension—now uncompensated—as increased outflow could not now take place—so that tension mounted from capillary venous to arterial pressure.

(3) Rise in venous pressure. Congestion implied not only increased volume of venous blood in the eye, but diminished absorption, already reduced to a minimum. The difference between chronic non-congestive and acute congestive glaucoma was one only of degree and not of kind. With the rise in intra-ocular tension the whole of the uveal tract participated equally in the resulting congestion and cedema. The amount and extent of the occlusion of the angle of the anterior chamber depended directly on congestive cedema of the iris, causing its base to become applied and then adherent to the posterior surface of the cornea. Once started, this process automatically increased with each congestive attack. The forward displacement of the ciliary processes, whether congested or atrophied, was not the cause, but the effect of the adhesion of the iris to the posterior surface of the cornea. The shallowing of the anterior chamber was also a secondary manifestation of congestion and cedema of the uvea. It resulted from swelling at the chief seat of origin of the zonular fibres—the orbiculus ciliaris—causing slackening of the suspensory ligament, which allowed the lens to assume a more forward position. Treatment did not affect the route to Schlemm's canal, already made impossible, but depended altogether upon the iris for its success. The greater the disorganization, the less did treatment avail. Myotics were beneficial in proportion as they opened out the existing iris crypts,

while iridectomy resulted in making a large crypt through which the aqueous could come into direct contact with the iris veins, for wounds of the healthy iris did not cicatrise.

Ophthalmic Conditions in the Government Schools in Egypt, and Their Amelioration.

Mr. A. F. MacCallan, chief ophthalmic inspector, Public Health Department, Egypt, read a paper on "Ophthalmic Conditions in the Government Schools in Egypt, and Their Amelioration." He reminded the meeting that at the last meeting of the British Medical Association he read a paper describing the work which had been carried on in Egypt by the ophthalmic hospitals during the previous four years, and this year he proposed to report on the clinical work at the two traveling hospitals during 1907. The number of new patients treated was 7,446, about one-third of the actual applicants. The average number of attendances of patients under regular treatment was 19. Patients to the number of 3,173 were seen who were incurable and who were sent away after the first examination. The total number of operations performed was 6,794, of which 194 were for the removal of cataract. Two thousand and one hundred and seventy-five cases of absolute blindness were seen, in 326 of which the cause was primary glaucoma. The number of patients blind in one or both eyes was 8.7 per cent of the total examined. Two thousand one hundred and ninety-seven persons were seen who had been operated upon unsuccessfully by charlatans for trichiasis; in most of the cases lagophthalmos had been produced without curing the trichiasis. The work had been carried on during the last year by two traveling hospitals originally established by Sir Ernest Cassell. One new permanent hospital established and maintained by the government will be opened this year, and a permanent hospital, built partly by local effort but maintained by the government, will be opened next year. The Egyptian government has been kept fully aware of the ophthalmic needs of the country during the last year by Mr. Graham, the director general of the public health department; and it is probable that money for further ophthalmic relief will be forthcoming from the ministry of finance as soon as the results of the recent financial depression have disappeared. He said the objects of treatment should be to produce cicatrization as quickly as possible and with a minimum deposition of fibrous tissue. Trachoma, he said, was a disease which usually required surgical intervention, and could not be cured by drugs alone in Egypt. He then discussed the

possibilities of obtaining ophthalmic treatment in Egypt, and gave some of the reasons why treatment had been so little sought in that country in the past. Of the pupils in the schools of Tantah 95.67 per cent showed signs of active or passing trachoma. More than 82.5 per cent had subnormal vision, and 45.5 per cent had opacity of one or both corneæ. He described the means which had been adopted at Tantah school with a view to the improvement of the ophthalmic conditions described, dividing these into prophylactic and voluntary. Of the treated cases, 87.2 per cent showed improvement at the end of the school year, as compared with their condition at the beginning. Of the untreated cases, 5.9 per cent only showed improvement.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Seven stated meetings having been held with an attendance of 110 (67 per cent) members and 24 visitors. Thirty-seven cases have been presented, 17 cases reported, and 123 represent the number participating in discussion.

A symposium was held on the "Ocular Effects of Alimentary, Renal and Cardio-vascular Disturbances." Papers were contributed by one of our members and by three invited guests on this subject.

Largely as the result of the efforts of one of our members, an institution for the industrial training of adult blind of Colorado has been established in Denver.

Communications have been received from Prof. J. Hirschberg, an honorary member of this society.

In May a banquet was tendered Prof. Carl Hess by members in Denver, and he was driven about the city and given a mountain trip over the continental divide.

In addition to the printing of our proceedings in the OPHTHALMIC RECORD since December 1900, the *Annals of Ophthalmology* and the *Journal of Ophthalmology and Oto-Laryngology* have requested these reports during the past year, and are now publishing the same regularly.

GEORGE F. LIBBY,
Secretary.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. G. Oram Ring of Philadelphia has returned from abroad.

Dr. Gustav Freytag has qualified in Munich for ophthalmology.

Professor Dr. Uthoff has been chosen rector of the University of Breslau for the coming year.

Dr. Henry M. Cunningham of Marquette, Mich., has returned from a tour of post-graduate study in Europe.

Dr. Karl Hoor, professor of ophthalmology in Klausenburg, has been appointed director of the new eye clinic in Budapest.

Dr. C. A. Bahm is consultant for diseases of the eye on the staff of the free clinic of the Louisiana Antituberculosis League.

Privat-Dozent Dr. Paul Römer has been given the title of professor at the Institute of Hygiene and Experimental Therapeutics in Marbourg.

Professor Cirincione has been called from Palermo to take the chair of ophthalmology at Rome, made vacant by the death of Professor Businelli.

Professor Dr. J. V. Troitsky, assistant ophthalmological professor of ophthalmology in Charkow, has been made an ophthalmological professor.

Dr. George C. Savage of Nashville, Tenn., will preside at the coming meeting of the Southern Medical Association in Atlanta, Ga., November 10-12.

Dr. Frank Allport of Chicago has resigned as professor of ology and clinical professor of ophthalmology at Northwestern University Medical School.

Dr. Ernest A. Crockett, ophthalmic surgeon on the staff of the Central Maine General Hospital, died of typhoid fever at his home in Lewiston, Maine, aged 37.

Dr. Melville Black of Denver was re-elected secretary of the Colorado State Medical Society at its thirty-eighth annual meeting held in Denver, September 8-10.

Dr. Casey A. Wood of Chicago has resigned his chair of professor of ophthalmology and that of professor of clinical otology at Northwestern University Medical School.

Dr. Clarence A. Veasey of Philadelphia has resigned his position as ophthalmic surgeon to the Methodist Episcopal Hospital and his chair of associate professor of ophthalmology in Jefferson Medical College.

Announcement is made of the engagement of Dr. Alfred Murray of Chicago to Miss Edna Schmidt, daughter of Mr. and Mrs. Albert C. Schmidt, 1893 Sheridan Road, Chicago. The date of the wedding is not given.

Dr. Wendell Reber of Philadelphia was appointed alternate delegate to the American Medical Association from the Medical Society of the State of Pennsylvania. Dr. William Campbell Posey of Philadelphia was made chairman of the section on specialties of the same society.

Notwithstanding the resignations of Drs. Wood and Allport from Northwestern University Medical School, Chicago, as noted elsewhere in these columns, the eye and ear clinics at St. Luke's Hospital, Chicago, will continue as heretofore. They will commence as usual, at 2 o'clock every Thursday afternoon. Resident and visiting surgeons interested in work of this nature are cordially invited.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|--|--|---|---|---|---|
| 9 A.M. | Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) *Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.G.) | G. W. Mahoney (Poli.) |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | ..... | ..... | ..... | ..... | ..... | ..... |
| 1 P.M. | ..... | A. G. Wippert (E. E. N. T.) | ..... | A. G. Wippert (E. E. N. T.) | ..... | A. G. Wippert (E. E. N. T.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. I. Gardner (E. E. N. T.) M. H. Lebensohn (Inf.) W. A. Fisher (E. E. N. T.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) D. A. Payne (Ills. Med.) E. K. Findlay (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) M. H. Lebensohn (P. & S.) Francis Lane (Rush) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) M. H. Lebensohn (P. & S.) Francis Lane (Rush) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) J. B. Loring (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) M. H. Lebensohn (P. & S.) Francis Lane (Rush) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | Chas. H. Beard (Inf.) W. Allen Barr (Inf.) *Frank Allport (St. Luke's) *Frank Brawley (St. Luke's) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) E. J. Gardner (E. E. N. T.) *Paul Gailford (St. Luke's) *Casey Wood (St. Luke's) *T. A. Woodruff (St. Luke's) J. B. Loring (Inf.) D. A. Payne (Ills. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) Francis Lane (Rush) M. H. Lebensohn (P. & S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Rush) H. W. Woodruff (Inf.) N. A. Young (Inf.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) W. A. Fisher (E. E. N. T.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) D. A. Payne (Ills. Med.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) M. H. Lebensohn (P. & S.) S. L. McCreight (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | Il. H. Brown (Ills. Med.) | *J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | ..... | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.G.) |
| 4 P.M. | W. F. Coleman (P.-G.) | C. W. Hawley (P.-G.) | G. F. Suker (P.-G.) | C. W. Hawley (P.-G.) | W. F. Coleman (P.-G.) Brown Pusey (County) | ..... |

*Special operative eye clinics.

ABBREVIATIONS:

C. C. S.: Chicago Clinical School,
819 W. Harrison Street.
E. E. N. T.: Chicago Eye, Ear, Nose
and Throat College, Washington and
Franklin Streets.
Cook County Hospital, W.
Harrison and Honore Streets,
Ills. Med.: Illinois Medical College,
182 Washington Blvd.
Inf.: Illinois Charitable Eye and Ear
Infirmary, Peoria and Adams Streets.
2431 Dearborn Street.
N. W. U.: Northwestern University,
2431 Dearborn Street.
Post-Graduate Medical School
of Chicago, 2400 Dearborn Street.
St. Luke's: St. Luke's Hospital, 1416
Indiana Avenue.
Rush: Rush Medical College, W.
Harrison and Wood Streets.

THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

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THE LIMITATIONS OF OPHTHALMIC PRACTICE.

DERRICK T. VAIL, M. D.,

CINCINNATI, OHIO.

The history of the development of scientific ophthalmology, embracing as it does a succession of brilliant achievements within the last half-century, would read like a fabulous romance of discovery and adventure in a dark continent. But it is not my purpose to panegyryze nor to dwell on the victorious efforts of those whose work has made the modern practice of ophthalmology possible. The purpose of this discourse is to ascertain, if possible, what rightly constitutes the practice of ophthalmology, what the limitations or boundary lines of ophthalmic practice are, beyond which we need scarcely look for information and within which we may feel we are practicing ophthalmology and not poaching on the preserves of other branches of medical and surgical science.

The subject naturally divides itself into (a) the field of study and (b) the field of practice.

The field of study: The field of study is the same as that for all other branches of medical science—plus an intimate knowledge of the ocular structure. In other words, the ophthalmic surgeon must be a qualified doctor of medicine and surgery who practices ophthalmology. This course is necessary because of the fact that there is at least an indirect connection between the eye and every organ and working part of the entire human organism. It is also necessary for the oculist to be well posted in allied or collateral sciences, such as climatology, hygiene, sociology, physics, psychology, evolution, heredity, race, diet, habits, occupation, plant-life, germ-life, etc. So that by a short process of reasoning we come to the conclusion that the field of study for ophthalmology embraces the heavens above, the earth beneath and the waters under the earth, and all that in them is.

The field of practice: The field of practice naturally embraces the various therapeutical and surgical procedures in vogue for cor-

President's address, delivered before the American Academy of Ophthalmology and Oto-Laryngology at its thirteenth annual meeting, held in Cleveland, Ohio, August 27, 28, 29, 1908.

recting the diseases and anomalies that affect the eye alone. That brings us to the study of what rightly constitutes the "eye alone."

The eye is the organ of vision, by which we do not mean the eyeball alone, for that as we well know is only the distal end of the organ of vision; we mean every part of the apparatus by which we see. This must of necessity include all the structures which are directly concerned in the act. It includes the orbital contents, the bony walls of the orbit, the optic tracts, the nerves furnishing the impulses called sensation and motion, their origin, course and distribution, the arterial, venous and nerve supply to and from these several structures and the knowledge of the pathways of vision from the retina to the brain cortex and back again.

If we look into the subject we soon convince ourselves that scarcely any one now-a-days practices within the narrow confines of the eye alone. If we find a case of neuro-retinitis or retrobulbar neuritis, we find ourselves inquiring into the systemic causes for these diseases, for we can not successfully correct the diseased processes without correcting the causes as they exist within the body. This takes us at once within the domain of the internist, for we must have a good knowledge of systemic diseases in order to interpret and successfully manage the local disease.

Many ocular diseases are the local expression of blood disorders, something in the blood stream which finds in the delicate capillary system of the retina and choroid a suitable nidus for setting up a diseased process, such as in malaria, pernicious anemia, etc. This implies a knowledge of the blood, and at once renders the oculist to a certain extent a hematologist. The blood circulating in the eye must draw its supply from the common blood stream which supplies nutrition to the rest of the body. The blood, having been oxygenated in the lungs, filtered in the kidneys, renewed and reinforced by the blood-making organs, correctly treated and supplied by the various constituents from the ductless glands of the body, as regards the suitable chemical and biologic properties and supplied newly and in well balanced proportion at all times that which has been burnt up and swept away by tissue metabolism, is the same blood that permeates the tissues of the eye.

It is therefore true that a diseased process set up in any important organ of the body will at least cast a reflection in the eye, where the sensitive and delicate capillary membranes such as the iris, retina and choroid are visible to the eye of the observer, as is true in no other capillary tissue in the body. Thus it is that we look into the eye and diagnose Bright's disease, uremia in the

pregnant woman, tuberculosis, cerebro-spinal meningitis, brain tumor and abscess, diabetes, etc. We should know the signs of these ailments as expressed in other parts of the body and search for them, thus encroaching, so far as the examination goes, upon the domain of the general practitioner. We have right to know what causes the ocular disease and should let no case of retinal exudation or hemorrhage, optic neuritis or motor paralysis go unexplained.

Other diseases as expressed in the eye are the local expression of a disease affecting the cerebro-spinal nervous system. I refer to the various palsies affecting the eye muscles, singly or in groups. Atrophies of the optic nerves dependent on general nervous degeneration or degeneration of certain tracts of the spinal cord, neuritis dependent on toxic and toxemic conditions which are operating in the system, are diseases which properly belong to the neurologist, but they often first come to us because the ocular symptoms are the first noticed, and we should be conversant with the systemic expression of these diseases in order that we may find corroborative evidence to substantiate our diagnosis. In other words, we should be well up on neurology in order to understand and correctly advise in the cases of ocular disease dependent on general nervous diseases.

Owing to the fact that nearly all forms of conjunctivitis and many maladies affecting the glandular and tear drainage apparatuses are directly due to germ life, and also to the fact that the various tumors, malignant and benign, which are found in and about the ocular structures, are of such nature that a correct diagnosis can not be made without laboratory methods and an intimate acquaintance with the microscope and what is revealed by it, and also because of the fact that the pathological processes affecting the ocular bulb and other structures are only understood when the specimen finds its way through a well-regulated pathological laboratory, it becomes now-a-days a matter of necessity that the oculist should be a laboratory man. The day is at hand when the oculist who is doing his duty by himself and his patients must have his own laboratory, or at least a hospital laboratory available, where he will trace the active cause or study the result of disease. The field of practical ophthalmology contains within it the need of a properly equipped laboratory and the oculist should cultivate this much neglected department of science in order that he may be intelligent and expert in his work and give his patients the best service. It is true that we can not all

become pathologists: the fact is that but few can do so, but it is necessary in this day and age for each one of us to know the principles of the subject, and have a good understanding of germs and germ life, as well as a familiar knowledge of the histology of ocular structures and the behavior of the ocular tissues when affected in the various stages of disease and inflammation.

Embryologically considered, the eye is an outgrowth of the brain and after full development, it retains in more or less restricted ways direct connection with the cerebrum through the second, third, fourth, fifth, sixth and seventh nerves; likewise with the spinal cord through certain cervical nerves. The arteries which supply blood to the eye and adnexa are branches of the carotids, which supply most of the blood circulation in the head, face and neck, and while the arterial blood stream is only in one direction—away from the heart, always passing forward toward the capillary terminals, and never backward—yet the blood passing through these channels is drawn from the common stream. The venous circulation begins where the arterial ceases and carries the darkened and effete blood backward along channels constantly increasing in size, gathering added supplies from other sources on its way to its destination. The venous blood from the eyelids, orbits and eyeballs admixes with that from the nasal chambers, scalp, meninges, face, ear, throat, skull bones and face bones, their diploic and pneumatic spaces, and finally passes down the jugulars in the cava-descenda to the right heart. The lymph stream, commencing where the capillaries exist in the eyelids, eyeball and orbital tissues, finds its way to other destinations in lymph glands, variously located about the ears, pharynx, neck and throat, these glands being likewise the receiving stations for lymph en route from all the various organs and anatomical structures of the head, face and neck.

The nerves furnishing impulses of sight, feeling, motion, secretion and nutrition to the various ocular structures are so intimately connected by intercommunicating fibres in the brain, likewise by an abundant interassociation in the various nerve ganglia inside and outside the skull cavity with other outlying structures, such as the ear, nose, face, scalp, neck and throat, that it is impossible to consider the one without considering the other.

From this desultory and cursory survey of the sanguino-lympho-nerve connection that exists between the eye and other structures of the head and neck, it is patent that the legitimate scope of the oculist is at least not the orbital contents alone, for

how can he, knowing these structures to be so woven together that there is not the warp and woof of the most cunning loom that the ingenuity of man has achieved or dreamed of devising that compares with it, how can he separate the eye-tissues from the adjacent tissues as if an impervious wall separated them, and cling to the hallucination that he can successfully practice ophthalmology and never look into the nose, never examine into the ear, never consider the throat, ignore the blood, disclaim any knowledge of physical diagnosis and boast of his ignorance of anything and everything except the organ of vision alone? The presence in our libraries of volumes on such subjects as "The Eye and the Nervous System," "The Eye in Relation to General Disease," "The Eye and the Accessory Nasal Sinuses," "The Eye and the Brain," etc., proclaim in silent but unmistakable terms that our periscope vision has widened and that we are physicians first and oculists next. The trend of modern literature on ophthalmology is growing rapidly toward a broader and more universal knowledge of the subject.

I hope to see the time when ophthalmology will be taught in this country as it should be taught. That day will come when we, as oculists, demand that a certain amount of preliminary education and training be enforced before a man may be licensed to practice ophthalmology. It should be no longer possible for a man to be called an oculist by himself or by the laity, after he has spent a month or six weeks in some post-graduate school or after serving as assistant for six months or a year in some oculist's office. It is a blot on our fair escutcheon that any man be so regarded after such short courses of attendance in any post-graduate school or even after six months' service without the proper preliminary training. When we require students to qualify by years of study in general medicine or by a year or two of experience as an interne in a general hospital and then after a sufficiently long time of service in an ophthalmic institution in America or abroad, he should be permitted to appear before a proper examining board, similar to any State Board of Examination and Registration, for examination, and if he is found competent, let him then be permitted and licensed to practice ophthalmology.

But to return to our subject, we should draw a sharp line between the study of ophthalmology and the practice of ophthalmology. The study necessarily includes every bodily ailment that has its ocular phase, and the practice should include the various

surgical and therapeutical measures directed toward the cure of the abnormal ocular condition. The oculist has a singular opportunity for diagnosing systemic conditions on account of the oft-times infallible ocular signs of such diseases present, and as soon as possible he should refer the case over to the physician with full report of what he has found.

The general practitioner now-a-days shows a very kind attitude toward the specialist, especially if he works with him and not against him. And really the general practitioners should feel grateful toward well-behaving specialists for the existence of a class of men who limit their practice to a specialty, removes from the ranks of general practitioners a large number of able men who, if they practiced general medicine, would make vast inroads into their business. Moreover, much of the rapid advancement of medical learning has come from the work of the specialists in the various departments. Whether the oculist has the right to practice other specialties, such as the nose, throat and ear, is a question *for each man to decide for himself*. The relation between the eye and the nose has recently become appreciated to a degree that it would seem to be the duty of the latter-day oculist to understand this relationship and to be prepared to practice in the nose if he expects to afford his eye patients the relief they seek and have a right to expect. The rhinologist has a right to view the situation differently from his side, since the cases which go to him usually have no eye symptoms. Patients with eye symptoms do not usually go to the rhinologist and nose cases usually do not go to the oculist. The field of ophthalmic practice is changing to include the nose; this is true whether we would have it so or not. The rhinologist and oto-laryngologist may likewise see his field broadening to include territory which a short while ago seemed to lie outside of his legitimate field of practice.

Between the eye and the ear there is not so intimate an association as between the eye and the nose, and yet we have ocular signs of otitic diseases, that include palsy, strabismus, nystagmus, lagophthalmus, optic neuritis and neuro-retinitis, thrombosis of the retinal veins, irregular pupillary behavior and many others. Between the throat and the eye there is but slight connection, except in a few instances, *e. g.*, adenoids and phlyctenular and catarrhal conjunctivitis.

In closing I would enter a plea for a broader field of study for oculists, which carries with it somewhat wider limitations of ophthalmic practice.

TEACHING THE SUBJECT OF OCULAR REFRACTION.*

EDWARD JACKSON, M. D.

DENVER.

With regard to the teaching of refraction, medical *students may be divided into two classes*: those who will take no especial interest in diseases of the eye, and those who will practice ophthalmology, the recognition and measurement of errors of refraction constituting a large part of their daily professional work. It may be questioned whether the latter class should receive recognition in the undergraduate teaching of medicine. But as students come to the study of medicine better prepared by collegiate training, and the previous study of physics, chemistry, biology, etc., the final year of the medical course may be given more largely to elective studies: and among these the study of refraction, as a preparation for the practice of ophthalmic surgery, may well find a place.

The distinction between *teaching refraction as part of the general medical education*, and teaching it as a basis of special practice, is emphasized because the accurate diagnosis or measurement of the refractive errors of the eye is probably the most highly specialized branch of medical practice, the one that differs most from the mass of work done by physicians and surgeons. Proficiency in it is attained only through a training different from that which gives mastery in other branches of practice.

Any one can hold a series of glasses before a patient's eye and ask him to tell if one suits him better than another. The optician undertakes the measurement of refraction after a course at some "college of ophthalmology" of a month or a week, or without any instruction whatever. But the community is amply supplied with "refractionists" of this grade. To send out young doctors who will do this sort of work is to demonstrate to the community that the claim that refraction should be wholly in the hands of the medical profession is false. To teach a medical student, well trained in other respects, that the crude guessing he can do after the instruction given to the large classes of our medical schools will do justice to patients suffering from eye-strain is to teach him a low estimate of the importance of refraction work. The suggestion to get a trial case and do a little work on refraction while waiting for general practice is partly responsible for the low estimate often placed on the value of the accurate correction of refractive errors.

Admitting that all medical students cannot be trained in the

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accurate diagnosis and correction of errors of refraction, let us consider what instruction upon this subject can and should be given to every student of medicine. *Preliminary education* ought to furnish a sufficient knowledge of mathematics and physics, and even of general optics. In time doubtless it will. But up to the present the student who has received a good preliminary training in these branches is the exception. Even the college graduate may come to the medical school ignorant of optics. As things now stand the first duty of the teacher of refraction is to find out the deficiencies in the preliminary training of his students, and, so far as he can in one or two lectures, supply the more important preliminary facts.

It is not an extensive or general *knowledge of mathematics* that is required. But the student ought to have a good acquaintance with the elements of algebra, plane geometry and plane trigonometry. The essential thing is that he shall be able to think in geometrical terms; be able to grasp geometrical conceptions of quantities and relations. I have never attempted to take medical students over the subjects of geometry and algebra in a preliminary lecture, but I have sometimes given a little time to the trigonometrical functions, and their relations to each other, and generally go rather minutely into the most elementary optics. Even with the very limited time allowed to ophthalmology in the medical curriculum, a lecture or two spent in drilling the students in these elementary conceptions results in a saving of time before the course is completed.

The ability to think in terms of geometry is cultivated by the general use of diagrams, models and apparatus. The teaching of *the theory of refraction* should be constantly aided by their use. It has been too much the custom to reserve this teaching for the course in ophthalmology, commencing in the third or fourth year of undergraduate medical study. It can better be arranged to give it as a part of the courses on anatomy and physiology to the second year medical students. Given at this time it allows the ambitious but poorly prepared student an opportunity to do, outside of his regular course, the necessary work in mathematics in which he may have been deficient.

Some thirty years ago Gowers wrote of the ophthalmoscope: "The use of the instrument and the examination of the normal fundus are parts of practical physiology, and might with great advantage be taught in that course in conjunction with the study of the anatomy and histology of the eye." Gowers' point of view

was not that of the ophthalmic specialist, but of the physician who appreciated the general importance of the ophthalmoscopic symptoms of disease. If the anatomy and physiology of the eye are taught with the same thoroughness as are other parts of anatomy and physiology, little time need be devoted to the physical and physiologic sides of the ocular refraction when the course on ophthalmology is reached. This latter course may begin with the *clinical aspects of eye-strain* arising from errors of refraction. With these all students should be made thoroughly familiar. In the majority of cases of headache the eyes are most at fault. In every case of headache the differential diagnosis must be made between headache arising from eye-strain and that due to other causes. Such differentiation of headaches and their proper treatment constitute an important part of the work of the general practitioner. The headaches of eye-strain can be made to throw light upon the pathology of headache in general. There is every reason why the headache, nausea, vertigo and other nerve symptoms that arise from eye-strain should be thoroughly studied by all who intend to practice medicine in any of its branches.

In teaching the clinical aspects of refractive errors the so-called "case method" may be employed with advantage. That is, the notes of striking and typical cases thoroughly worked out should be brought before the student to be studied like a case in actual practice. The presence of the patient is not necessary where the symptoms are so largely subjective. Later, patients may be examined and treated before the class, but a general comprehension of the nature and importance of the symptoms produced by ametropia will be more quickly and more forcibly impressed by selected case histories.

Having taught the medical student the importance of eye-strain under the conditions of our modern civilized life, the symptoms that indicate it and the reality of their relief by correction of ametropia, I would give the general student of medicine a mastery of certain *rough tests*, viz., the pin-hole test to improve vision lowered by any form of ametropia; the discrepancy between distant and near vision for the recognition of myopia; the increased distance of the near-point, and the ability to see clearly at a distance through convex lenses, as distinguishing hyperopia, and the varied distinctness of the radiating lines indicating astigmatism. With these tests, however, must go careful emphasis of the facts: that a patient may have ametropia sufficient to cause serious symptoms without noticeable impairment of vision or im-

provement with a pin-hole test; that in exceptional cases he may have a normal near-point and be unable to see at a distance through convex lenses, yet have hyperopia; and that with important astigmatia he may state that the radiating lines all look alike.

Finally the general student may be given a few cases of ametropia to work out the diagnosis and correction for himself. These, with proper supervision and criticism, will impress upon him the difficulties that attend the accurate measurement of errors of refraction and instil a proper caution as to the prescribing of glasses. To carry him through all difficulties and make the average medical student a master of this subject is impossible in the present undergraduate medical course. It may become in large degree possible when the last year of the medical course is devoted to electives, so that for students interested in it a sufficient part of the time can be given over to this particular kind of work. But it will always be a part of the training of the specialist.

The measurement of ocular refraction is as much a *matter of physical measurement* as the surveying of land, or the weighing of the results of chemical analysis, or the measuring of the angles separating different stars. Those who are familiar with the teaching of physical science know that some persons never can become expert astronomers or analysts, simply because they cannot be trained to make accurate physical measurements. The so-called personal equation, the inaccuracy that necessarily attaches to the measurements made by a particular individual, becomes an important consideration in the exact observation of physical phenomena. The training of the practical "refractionist" must be very largely training in the making of accurate physical measurements. For objective methods this is the whole of it. For measurements made by subjective methods the "refractionist" must also become a practical psychologist. The preliminary training for the accurate measurement of refraction may be accurate work in the physical or chemical laboratory or the acquirement of the technique of microscopy, or even of skill in a manual training school or mechanical trade. It is something absolutely apart from the ordinary literary education, or from that class of observation and deduction that is equally useful to a detective or a medical diagnostician. Good preliminary training will be of great assistance to the student of refraction. But if he lacks it the deficiency will have to be supplied by additional drill with the test lenses, the skiascopic mirror, the ophthalmoscope and the ophthalmometer. Even with the best

drill some persons will always remain inaccurate in their measurements.

To discuss in detail the *teaching of each method* would extend this paper far beyond the allowed limit. But I would emphasize that every one of these methods should be made the subject of prolonged, painstaking, minute instruction. To set the student down before a patient in the dark room, give him an ophthalmoscope and tell him to find out which lens gives the clearest view of the patient's fundus, is not enough. He must be shown how to guard against the patient's accommodation, or his own. It must be pointed out that the refraction may vary two or three diopters between the center and the margin of the dilated pupil. He must be made familiar with the effects of differences of level in different parts of the fundus. He must be warned against being misled by blurring that no lens can clear up. His attention must be called to the fine vessels and details of pigmentation that offer the best tests of exact focusing. He must be trained in the modifications of the general method required for the measurement of astigmatism. For the subjective tests the details that should be made the subject of special instruction are even more numerous and more important. Only by prolonged and careful training with regard to them can the student attain such skill in the measurement of refraction as can rightly be demanded of the specialist in ophthalmology, after fifty years of good scientific work by the students and successors of Helmholtz and Donders.

The relief of patients who suffer from the effects of ametropia depends absolutely on the accurate measurement of their refractive errors. Only when such an accurate measurement has been made can we properly consider the questions of physiology, convenience or prejudice that may influence our prescribing of lenses. Whatever the superstructure we choose to erect upon it, a solid foundation is essential. Accurate measurement of refraction is a large part of the foundation of ophthalmic practice. Here lies the importance of drill in the accurate methods of measuring refraction.

This drill can only be given where the students can go to work upon the individual patient, *and spend the necessary time in mastering the difficulties each particular case presents*. This may be in a clinic, where the number of cases and the room for working are sufficiently large to furnish such an opportunity, or it may be in the private office of the instructor.

Whatever our disagreements as to the frequency with which it

is necessary to use *cycloplegics* in practice, it must be admitted that for the student learning to measure refraction it is better to be rid of the difficulties raised by accommodation. It is better for him to work in a clinic where cycloplegics are used for all patients who have not become presbyopic. When he has learned to measure refraction accurately by the various methods, with complete cycloplegia, he can go forward to overcome the difficulties raised by activity of the ciliary muscle, in so far as these can be overcome by means other than the use of cycloplegic drugs.

The apparatus necessary for the teaching of this subject includes that used in the measurement of refraction in actual practice, with diagrams or, better, the paper or blackboard, for their extemporaneous development. With a strong convex spherical lens and a card one can give a better conception of refraction at spherical surfaces than by any number of written or spoken words. The addition of a cylindrical lens with the shifting of the card from one focal line to the other and beyond has the same value in illustrating astigmatia.

Still optical models of the eye made with a glass chamber that can be filled with smoke or with a solution of fluorescein, to illustrate the course of the rays after refraction, are of real value. The same is true of the thread models of Knapp, or the wire and wood models of Burnett, and there is a great variety of apparatus for the beautiful illustration of the subject of optics. The various schematic artificial eyes can be utilized for the teaching of skiascopy and the measurement of refraction with the ophthalmoscope, and the artificial cornea is at first better than the natural cornea for practice with the ophthalmometer. But there comes a time when no apparatus can take the place of actual clinical work, and from the beginning very simple lens arrangements, well used, serve every purpose.

In *conclusion* the following points seem worthy of discussion. There is only a certain line of instruction with regard to refraction that can profitably be given to all undergraduate medical students under the limitations of the present medical curriculum.

The courses on anatomy and physiology should give to every student a good general knowledge of the refraction of the eye and the use of the ophthalmoscope. A certain knowledge of mathematics and physics should be required of every student who undertakes to study refraction in preparation for ophthalmic practice.

The measurement of the errors of refraction is a physical measurement to be learned by actually making such measurements.

and for which laboratory training in physics is the best general preparation.

Through all the teaching it is of highest importance to help the student to clear geometrical conceptions, and to this end diagrams and models are to be freely used.

THE TEACHING OF OCULAR PATHOLOGY TO GRADUATES AND UNDERGRADUATES IN MEDICINE.*

CASEY A. WOOD, M. D.

CHICAGO, ILL.

It seems superfluous to urge before an educated audience like this the claims of ocular pathology as an essential study in the curriculum of the undergraduate medical student. Still less uncalled for would at first appear a plea for teaching the same subject to graduates in medicine. So far as it concerns the undergraduate student, the study of pathology is the culmination of all his other studies, whether they be surgical or medical, or both. If we except clinical observations—and even these cannot be divorced from, and ought to always to be made with a side glance at the pathological aspects of a case—there is no other subject that so aptly combines, illustrates and applies all his previous investigations of human and comparative medicine. Without at least a fair knowledge of pathology—anatomical, histological, surgical and medical—all other knowledge of our profession is as “sounding brass and a tinkling cymbal.”

If this contention be correct, one may at once pass to the essence of this paper, and ask *how* may the *undergraduate* student make a practical acquaintance with this important and rather extensive subject without an undue expenditure of his time and energy?

At the outset one must bear in mind the comparatively recent extension and multiplication in America of the courses that comprise the medical student's curriculum. When it was possible to obtain a medical degree in three years, the burden of teaching was at least fitted to the shoulders of both teacher and student. The pressure on the time and brain of each was at least no greater than it now is, for the simple reason that comparatively few subjects were taught. In recent years conditions have changed. When, for example, the university in which I have the honor to teach decided not only to adopt a five-year medical curriculum, but to relegate to the matriculation examination several subjects previously taught in the medical school, one of the principal advantages that were ex-

*Read before the American Academy of Ophthalmology and Otolaryngology, Cleveland, Ohio, August, 1908.

pected from the change was the additional time that could be given to minor subjects, such as special pathology. This expectation has been realized, and, if I correctly read the educational signs of the times, the lengthening of the medical curriculum means not so much matter added to courses already in existence as specialized teaching in divided and subdivided subjects co-related to them.

Until recently a class in ophthalmology had (with few exceptions) to be content with, first, such rare and generally vague references to the morbid histology and pathogenesis of eye diseases as the time allotted to the subject permitted; second, with a few facts and theories of ocular pathology as they picked up in the laboratory, or in lectures on general pathology. Finally, they absorbed a few tidbits of information secured by their reading of text books.

From my own experience as a teacher, and from conversations with fellow teachers, I feel certain that what we now regard as neglect of this subject was not due so much to a lack of appreciation of its value and importance, but was the direct outcome, first, of insufficient time, and, secondarily, of defective equipment.

Now, with the addition of a year or two years to the collegiate course it is possible for the student to devote some time to the special study of ocular pathology.

In reply to the question as to how this may be most effectively accomplished I may be permitted to tell you how, after some thought and experiment, we have managed it in Northwestern.

The final class (I take it that the last year in college is the appropriate one for the purpose) being divided into sections of fifteen for teaching purposes, each one of these sections is given laboratory instruction in the pathology of the eye. As a part of this form of instruction, also, a course in the bacteriology of ocular affections is taught.

In addition to sectional instruction, a portion of each of the weekly lectures is devoted to the histology and pathological anatomy of the ocular apparatus illustrated chiefly by stereopticon views.

Of all the methods of imparting information regarding those alterations in structure and anomalies of growth and nutrition that make up the science of human pathology, I regard as the most important that which the undergraduate student receives in the laboratory. Here, under a competent teacher, he makes a systematic study of those tissue alterations which he is at the same time learning to recognize from clinical observation in the dispen-

sary and from lectures in the amphitheatre. It serves to complete and fix in his mind the mental picture, often uncertain and shadowy, with which he has been impressed in hospital wards, in the operating amphitheatre and in the lecture room. Each member of the class studies, under the eyes of an instructor, a certain number of typical microscopical slides that represent as far as possible the commoner diseases of the eye—those that he is most likely to encounter in practice—draws them, asks and answers questions about them and in particular endeavors to acquaint himself as thoroughly as possible with the pathological histology of the parts. The last of these monthly lessons consists of a general review.

In addition to an examination of these microscopical specimens, a large series of gross preparations, in formalin jelly, in Greeff bottles and as fresh material are gone over. Finally each student is presented with a series of twenty-five or more different, typical slides which he has already studied, for use after he has left college. This is done partly as a reward for the close attention necessary in all effective microscopical work and partly in the hope that it will stimulate him to continue to study not only minute eye changes, but general morbid histology as well.

Not much remains to be taught the undergraduate student of ocular bacteriology in any well regulated medical school, since as a junior he is pretty well drilled both in the theoretical and practical aspect of that study before presenting himself for ophthalmic instruction. However, several hours of the monthly sectional teaching is given over to emphasizing effective methods of detecting a few of the bacteria that are prominent from the ophthalmic standpoint—the Morax-Axenfeld diplobacillus, the Koch-Weeks bacillus, the xerosis bacillus and one or two others whose activities are to a large extent confined to or assume important phases in the tissues of the eye. In all this teaching my assistants and I try to recollect that we must not attempt to make ophthalmologists of undergraduate students. I think I can safely say that all the teaching in our department is in sympathy with one central idea—to impart such instruction as, in our judgment, will be of most value to students in their future career as general practitioners.

With post-graduate students the case is somewhat different in that the instruction meted out to them should vary with the individual need. It may be stated that, as a rule, the physician who desires a course in ocular pathology is better equipped and better trained than the average post-graduate student, as I used to know him when I taught in the Chicago Post-Graduate Medical School.

Unfortunate is it for post-graduate teaching in America that the usual, indeed the popular demand is for a six weeks' course in refraction, varied or not with a desultory attendance upon the practice of a clinic and an operating room. While there are notable exceptions to the rule our towns are being filled with men otherwise competent, whose practice of ophthalmology is based upon a few months of this incomplete and hasty sort of study. It cannot, therefore, be too strongly insisted upon that an earnest investigation of the elements of ocular physiology, anatomy and pathology should precede or at least run parallel with the clinical study of ophthalmology. In Northwestern, if I may again be pardoned an allusion to the school I know best, we decline to teach refraction, or ophthalmic operations or to give purely clinical instruction apart from these studies. We gladly furnish to the student as many or as few courses in the anatomy, physiology or pathology of the eye as he wishes, but if a physician wishes clinical instruction, if he wishes to "fit glasses and do operations," as he is generally pleased to term it, he must remain with us for at least six months and give a goodly portion of this time to laboratory work.

All courses are given by special instructors whose connection with other departments of the university enables us to have their coöperation, most of the instructor's fees being paid by the students themselves.

I would suggest that this scheme, modified of course to suit individual needs, be adopted by medical schools generally.

A course in laboratory pathology, including instruction in practical bacteriology, modern methods of hardening, preserving, sectioning, staining and mounting and studying eye sections would be a boon to those ophthalmologists who wish to keep abreast of the times. Likewise, in the case of the ophthalmologist already in practice, the accumulation of studied specimens—especially slides from cases worked out clinically—may well occupy at least a small portion of the time which he must properly give to his professional studies. Once a foundation is laid by a few months of this form of post-graduate study, it might readily be continued by concurrent reading and laboratory work at home to be refreshed and revived by short annual or biennial visits to the laboratory of a well equipped medical college.

In furtherance of this scheme I see no reason why any one of our undergraduate schools should not enter the field of post-graduate teaching. The adoption of such a plan would, among

other results, elevate the standard of post-graduate instruction—particularly in ophthalmology—and would soon make it unnecessary as well as undesirable for our American students to go abroad, as they now do, for any considerable portion of their instruction in matters pertaining to diseases of the eye.

THE ETIOLOGY OF CHOROIDITIS.

J. B. LAWFORD, F. R. C. S.,
LONDON, ENGLAND.

MR. PRESIDENT, LADIES AND GENTLEMEN:

It was not without considerable misgiving that I accepted the invitation to deliver an address in the Ophthalmological Section of this Academy.

While I was deeply appreciative of the honor offered to me, as an individual, and also as a representative of Moorfield's Hospital, I was equally if not more conscious of the responsibility incurred by my acceptance.

I regret very much that the time at my disposal for the preparation of an address was so limited: much more limited than the occasion deserves: June and July are busy months professionally, in London, and but little leisure was available to devote to my task. I, at least, am painfully aware how far short of my intentions are the results of my endeavors.

As a subject I have chosen one, "The Etiology of Choroiditis," which you will readily admit can not be dealt with "in toto" within the limits of an address and I have no intention of attempting impossibilities.

When I submitted the title to your president, he very kindly replied that in his opinion the subject was a suitable one, for, said he: "We need to be enlightened on the Etiology of Choroiditis."

Well, sir, I should like to assure you at the outset that I have not come prepared to disperse all the obscurity surrounding this subject. My endeavor is cast in a much humbler mold. I wish to address you briefly upon, what appear to me, some of the more important points concerning the etiology of choroiditis: to allude to recent additions to our knowledge on this subject, and to indicate some of the lines of enquiry which seem to me most likely to be fruitful. My remarks, therefore, will be essentially non-dogmatic, but may I trust prove suggestive, even if not wholly instructive.

Time will not permit, nor would the occasion justify any attempted classification of the causes of choroiditis, nor the presentation of many details such as clinical and pathological notes, the records of experimental investigation, etc., all of which have an interest of their own. I propose to deal almost wholly in generalities and to avoid laboring my address by frequent reference to the many authorities I have had occasion to consult. I shall begin with a little bit of history, part of which at least is reminiscence.

I intend to omit from consideration disease affecting the anterior part of the Uveal Tract (Iris and Ciliary body), although it is becoming increasingly doubtful if our somewhat artificial division of the uveal tract is altogether desirable from the pathological standpoint.

I imagine that I shall not be very wide of the mark in suggesting that to most of us in our student days, certainly to all those who began their professional studies twenty-five or more years ago, the query "What are the causes of Choroiditis?" was one of a somewhat limited number of questions which we felt quite prepared to answer. At that time the list of diseases known or believed to stand in casual relation to choroiditis was so small that no "Memoria technica" was required even by the most forgetful of students.

In the pre-ophthalmoscopic days and for some little time after Helmholtz's epoch-making discovery, inflammation of the choroid was scarcely recognized as a clinical entity. If we consult treatises on diseases of the eye, of the first half of the nineteenth century, by authorities such as Saunders, Mackenzie, von Ammon, Stellwag, Desmarres, and others, whose writings have become classical, we find under the heading of choroiditis, divers descriptions of symptoms, which, if read in the light of our present knowledge, generally suggests a diagnosis of glaucoma. In fact, some of the most careful of observers and most erudite of authors at that time used the terms acute choroiditis and acute glaucoma as synonyms. Tyrrell in 1810 wrote "Choroiditis in the acute or chronic form is not very uncommon, but it is not always recognized and is *indifferently understood*."

The causes of a disease so little understood were necessarily almost wholly matters of surmise. "Injuries, extension of inflammation from neighboring structures, disturbances of general health, etc.," were those most commonly enumerated.

When we contemplate the difficulties under which surgeons of

that time labored and remember how restricted were their means of examination of the eye, we can, to some extent at least, comprehend the limitations of their knowledge.

It is a curious fact that though the surgeons of that day were well acquainted with syphilitic iritis, they seem to have paid little heed to syphilis as a possible cause of inflammation of the deeper parts of the eye.

So careful an observer as Mackenzie does not mention syphilis as a cause of retinitis or choroiditis.

From this period of surmise and hypothesis, when subjective symptoms and external signs, if present, were the only available means of diagnosis, we pass almost abruptly to that happier time, when by the aid of the ophthalmoscope the evidences of disease of the choroid became visible.

At this time (between '55 and '60) when the use of the ophthalmoscope was becoming general the causal connection of *syphilis* to choroiditis was recognized and under the rapid spread of this knowledge other possible causes of the disease were speedily forgotten, or at least treated with scanty consideration. For a period of twenty-five years, or longer, syphilis as the origin of choroiditis dominated the medical world: writers of that era scarcely mentioned other possible causes, though the more experienced and cautious among them added the statement that in a "considerable proportion of cases no ascertainable cause existed." It is an interesting, almost a startling fact, that a similar *provisio* is necessary at the present time. In the 1908 edition of Fuchs' text-book, one of the most valuable and authoritative of treatises on ophthalmology we find as the concluding sentence upon the Etiology of Choroiditis, these words: "In many cases the cause remains obscure." So that in spite of the great advance in our knowledge, we can not yet claim to have arrived at a complete understanding of the causes of choroidal disease.

During the ninth decade of the last century, doubt began to arise or more correctly began to be expressed as to the sufficiency of the prevalent belief concerning the etiology of choroiditis and evidence in favor of broader and more inclusive views began to accumulate.

Among the earliest to give expression to doubt was that astute clinical observer, Jonathan Hutchinson, whose name is so closely associated with the various ocular manifestations of syphilis.

In an address on "Choroiditis Disseminata" in 1881 he stated

that "in early days he had been led to think that nearly all choroidal disease was of syphilitic origin. For some years he had entertained doubts and had been seeking evidence as to whether there were cases which were not syphilitic in origin and if it were possible to discriminate them. He had, however, no doubt that syphilis was the cause of a large majority of cases of choroidal disease."

During the last ten or twelve years, even if we judge by the literature of the subject alone, there has been a decided change of opinion. This has been shown in the recognition by all recent writers of the possibility, indeed the probability, of a much more varied etiology of choroiditis than had previously been taught or accepted. I gladly avail myself of today's opportunity to plead for a more thorough enquiry into the origin of disease of the choroid, especially in all cases in which its dependence upon syphilis can not be clearly proved. I think that, at all events until recently, many of us have been too ready to accept without qualification the dictum that the discovery of choroiditis, especially of the disseminate type, is tantamount to the discovery of syphilis. This attitude which was well described by Dr. Hiram Woods (in a paper read before the American Medical Association) in these words, "Lesions of the choroid suggestive of syphilis too often excite doubt as to the history rather than stimulate research for less common causes" is one which should now be wholly abandoned. It is not easy to comprehend why we have been so tardy in accepting the liability of the choroid to attack by the virus of diseases other than syphilis, many of which are as truly systemic in character. It would, I think, be strange if a structure like the choroid exhibiting, as we know, a marked susceptibility to the syphilitic virus should possess even the semblance of unanimity to the activities of all other diseases of an infective nature. I have been convinced for some years that we ought to widen the basis of our enquiries and investigations concerning the causation of choroiditis in its numerous forms. It is, of course, true that in not a few instances the most careful and thorough enquiry fails or has failed to explain the choroidal disease. But such enquiry and investigation if persistent will ultimately succeed.

As medical men, we live in fortunate times, although we do not invariably realize the fact, or make the best use of the opportunities offered us by the twentieth century. There has never been a period in the history of medicine, when so many means of determining the nature of disease have been available. Signs and

symptoms have always existed ready for interpretation. Now we are able to call to our assistance in diagnosis new and improved methods of examination of living tissues and of secretions and excretions, and the employment of various chemical, clinical and pathological tests (e. g., the different tuberculin tests). It is in the highest degree probable that these supplemental methods of diagnosis will soon become more widely applicable as well as more reliable.

There are good reasons for accepting the view that all forms of choroiditis (excluding the traumatic variety and that caused by extension of inflammation from adjoining tissues) are due to infection reaching the choroid in the blood stream. The blood is the vehicle which conveys to the choroid the phlogogenic material whatever its exact nature, which is capable of lighting up inflammation.

If the infection is mild, as is frequently the case in syphilis and tubercle, the virus does not spread widely from the blood vessels; localized endovasculitis is set up; round these foci, areas of inflammation develop and the choroiditis is desseminate in type; if the infection is severe, as for example, in pyæmic conditions, the septic material is too virulent for its effects to be limited to certain blood-vessels and their immediate neighborhood, inflammatory changes spread throughout the tissue and a diffuse choroiditis results.

Recent investigations* concerning endogenous infection of the eye, seem to show that the posterior part of the eyeball offers more favorable conditions for such processes than does the anterior part, and that the most serious forms of endogenous infection develop from the penetration of micro-organism into the posterior segment of the globe.

If the foregoing statements be even approximately correct, are there not infinite possibilities regarding the etiology of choroiditis, and is it not incumbent upon us to be fully alive to these possibilities?

A judicial survey of our present knowledge concerning the etiology of choroiditis, renders it clear to the enquirer that within certain limits our information is precise and definite and reliable, but that beyond these boundaries our knowledge is as yet indefinite and very incomplete.

It has been proved beyond all question that syphilis, both

*Selenkovski Westnik Ophthalmol: T XXI. I.

inherited and acquired, is a common, indeed by far the most common, cause of choroiditis, and I need not occupy time by dwelling upon a fact so well established. But before leaving this part of the subject, may I direct your attention for a moment to the protean character of the choroidal manifestations of syphilis, especially in the acquired form of the disease, and express the opinion that much caution should be observed in making a diagnosis, either positive or negative, from visible choroidal lesions alone. It is a truism to say that certain forms of choroidal disease are strongly suggestive of syphilis and that others are less so, but most ophthalmic surgeons are cognisant of cases of choroiditis of the familiar disseminate type (formerly considered as almost pathognomonic of syphilis) in which, neither from the examination of the patient, nor from the investigation of the personal and family history can any evidence be obtained to support the diagnosis of lues.

On the other hand we not infrequently see choroidal lesion of unusual and unfamiliar type whose dependence upon syphilis is (sometimes unexpectedly) established by a convincing history or by the discovery of characteristic lesions elsewhere.

The remote action of syphilis in the causation of choroidal lesions should be borne in mind. The vascular changes in the form of widespread arteriosclerosis which are so well known in the late stages of syphilis and which are among the most serious results of that fell disease, not infrequently lead to choroidal changes of a degenerative type. The results may be widespread when due to a generally diminished blood supply and consequent starvation of tissues; or may be limited in distribution when consequent upon blocking vessels in localized areas in the choroid.

Belief in the etiological relation of tubercle to choroiditis has become widespread in the last few years. Indeed a recent author, Venneman, the writer of an able article upon disease of the choroid in the *Encyclopédie Française d'Ophthalmologie* expresses the opinion that there has been a tendency of late to consider tubercle as the predominant cause of choroiditis; a view to which he does not subscribe. He says, "When syphilitic infection is denied and there is no clinical evidence thereof, we, too, readily assume the existence of a hidden focus of tubercle, Even if our patient is perfectly healthy in appearance, we do not hesitate to believe in some bronchial, mediastinal or mesenteric gland full of rotting bacilli, or of dormant spores. We should do better, I think, if we returned to the views of our predecessors and recognized

other blood disorders capable of preparing the ground for inflammation of the choroid, even if we do not accept their power of exciting the inflammation." As we shall see Venneman believes that tubercle is one of the causes of choroiditis, but is unwilling that such belief should render observers oblivious to other causes.

Infection of the choroid during the course of tubercular meningitis and other forms of acute tuberculosis is a well-established pathological fact and may be passed by without further comment. Our knowledge of the connection between tubercle and varieties of choroiditis occurring independently of acute fatal tuberculosis is much less definite, and to this comparatively little known subject I desire to direct attention.

A large number of observations, both clinical and pathological, concerning tubercle and its relation to disease of the uveal tract are to be found in the medical journals of the last decade and especially of the latter half of that period (see bibliography). I do not propose to weary you with detailed reference to these papers, most of which I have consulted. They are with few exceptions valuable contributions to our knowledge and worthy of study.

The evidence which has been accumulating during the last few years goes far to show that choroiditis of varying type, and both diffuse and circumscribed, may result from tubercular infection. Some recent authorities (notable Venneman (1) in Europe and de Schweinitz (2) in this country) have spoken with no uncertain voice on this point. Venneman says, "It appears to me absolutely certain that tubercular infection can excite inflammation of the choroid," and de Schweinitz, in an interesting paper published two years ago, speaks of "the fact now well established that a very considerable number of cases of ordinary disseminated and diffuse exudative choroiditis, and rarely, localized choroiditis are due to tuberculosis." I quote the words of these two writers because they seem to me weighty statements and worthy of our best consideration. While I am fully convinced that tubercle is a cause and perhaps a common cause of choroiditis, I feel that we have not as yet sufficient information to enable us to define its relation to the more common varieties of choroidal inflammation, such as the familiar disseminate form, as clearly as we can in regard to syphilis.

All, or nearly all, ophthalmic surgeons have seen cases of

(1) *Encycl. Francaise d'Ophthal.* Vol. 6.

(2) *Annals of Ophthal.* Vol. 15.

inflammation of the choroid undoubtedly tubercular in origin; such cases are usually examples of severe but localized inflammation. Some years ago von Michel advanced the opinion that chronic choroiditis with all the character of the ordinary disseminated form might be tubercular in origin, but the evidence then adduced can hardly be said to be conclusive. Personally I have not yet been able to prove the tubercular nature of disseminated choroiditis of the usual type, in cases in which syphilis as a cause could be excluded, and I am not aware of the record of such a case. I think there are good reasons for suspecting many of these unexplained cases to be tubercular, but suspicion is not proof, and until satisfactory evidence is forthcoming we must reserve judgment.

We are, however, quite justified in the general statement that tubercular infection is a cause of choroiditis. This fact, in my opinion, is one of great and increasing importance, not only in reference to diagnosis but also in relation to prognosis and treatment. The means for the detection of tubercle in man are now so easily available and under improved methods are becoming so reliable that the diagnosis of tubercular choroiditis may before long become more certain than that of any of the other forms of disease of this structure.

Even with this comforting thought of help in diagnosis, we should not fail to recognize that our knowledge concerning tubercular choroiditis is at present very imperfect, especially from the clinical side, and that further and more precise information is urgently wanted. We want evidence from cases carefully observed and thoroughly investigated, and evidence such as can be obtained only from collective enquiries. For example, we have no reliable information at present as to the comparative frequency or infrequency of tubercular choroiditis; we do not know if there are types of disease which may be considered more or less characteristic, or whether symmetry or asymmetry is the rule.

These and other doubtful points require elucidation; may I commend them to you as fit matters for enquiry.

In order not to weary you I propose to pass by, with merely a word of reference, a number of diseases, all of which have been shown to be at times associated with choroiditis. Such are—enteric fever, malaria, several of the exanthems, influenza, systemic gonorrhoeal infection, many of the anemias, gout. Some of these, e. g., enteric fever and influenza may, with little if any

doubt, be included in the category of causes of choroiditis: concerning the others, we have as yet very scanty information.

I would also allude here to the possible connection between certain occupations and the occurrence of choroiditis. A paper has been published recently containing the record of a case of choroiditis in a man who was a worker in Naphthalin; the choroidal lesions and the clinical symptoms of central defect of vision and concentric narrowing of the field of vision were attributed to the poisonous effects of Naphthalin.*

One of the most interesting questions which arise during the consideration of the etiology of choroiditis, and one which opens an almost unlimited field of enquiry, is that of the relation which certain toxic and septic conditions bear to inflammatory lesions of the choroid. The importance of these toxic conditions as causes of choroiditis has only recently been recognized, and has, I think, received more attention in this country than elsewhere. Several well-known writers, among whom I may mention Stedman Bull and de Schweinitz in America, and Elsenig in Germany, by the publication of observations and records of cases have brought this subject forward, and it is one to which attention may profitably be directed.

The toxic conditions to which I refer are chiefly those which result from the ingestion of poisons of the ptomaine group, and from varieties of auto-intoxication, this latter term being used to designate the conditions induced by poisons which are manufactured in the tissues of the individual. Such toxins may be derived from collections of septic material, e. g., boils, abscesses, pyorrhœa alveolaris, and other purulent foci, or may originate in the products of metabolism in the tissues of the individual. Such products may be noxious because metabolism is faulty, as is generally the case, or because with normal metabolism, they accumulate in poisonous quantities.

Although we are well aware of the general symptoms of poisoning often induced by the action of these toxins, we have but scanty knowledge concerning the local effects, including ocular lesions, to which they may give rise.

Moreover, we have as yet very little information regarding the exact nature of the poison or poisons which the living tissues are capable of producing. So far as I know the identity of the toxins which induce auto-intoxication has not yet been established.

*Van der Hoeve. Arch. f. Augenheilk. 56 p. 259.

Toxæmias originating from the products of faulty metabolism are probably in the majority of instances intestinal in origin, but we are frequently unable to determine the source of the toxins. It is, however, fairly certain that the products of intestinal putrefaction, whatever their exact chemical or microbial characters may be, are important factors in the causation of inflammatory changes in distant tissues, among which the choroid must be reckoned.

The effects of auto-intoxication upon the eye are more generally known (probably because of their greater frequency) as irido-cyclitis than as choroiditis. Elschnig has shown that in a certain number of cases disease of the uveal tract (irido-cyclitis and relapsing iritis) is associated with and probably dependent upon intestinal decomposition, and he suggests that the same statement may be true of chronic choroiditis, but that "convincing observations on this point are wanting." De Schweinitz in commenting on Elschnig's paper says: "It appears to me from my own experience and that of my colleagues that cases are accumulating in which various types, chiefly of plastic choroiditis (localized), and sometimes disseminated choroiditis, must be attributed to an inflammation which is derived from a disordered gastro intestinal tract either as an auto-intoxication or an auto-infection." On the other hand, Venneman states that choroid-retinitis due to intestinal auto-intoxication always begins as an iritis.

A paper by De Schweinitz, presented to the American Medical Association two months ago, is a valuable contribution to our knowledge on this little known subject. It contains, as many of you are aware, the record of almost ideal clinical and laboratory examinations of cases in which ocular disease was associated with evidence of auto-intoxication of gastro-intestinal origin.

Concerning acute choroiditis occurring as a result of septic or toxic conditions, we can speak with less uncertainty. A small number of cases of severe and acute forms of choroiditis due to toxic material originating in the intestinal tract or elsewhere are on record. Among the most noteworthy are those published by Stehman Bull⁽¹⁾ and Holmes Spicer.⁽²⁾

Bull has given us a very careful report of two cases in which severe choroiditis was caused by toxæmia of gastro-intestinal origin. Spicer's case was one in which metastatic infection of the choroid occurred, the source of infection being an abscess in the skin. In this instance the Staphylococcal nature of the infection in the skin

⁽¹⁾ Trans. American Ophth. & Soc., 1906.
⁽²⁾ Trans. Ophthol. Soc. U. K., 1907.

and in the choroid was demonstrated by microscopic examination.

We may, I think, accept the statement that there is already sufficient evidence to prove a causal connection between toxæmia, resulting from auto-intoxication or auto-infection and inflammatory lesions in the choroid. Moreover I believe it to be very probable that this causation of choroiditis will be shown to be more frequent than is at present recognized.

If the observations previously referred to, regarding the relation between the activity of the virus and the form of choroiditis which results from invasion, be correct, there is no obvious reason why mild and chronic, as well as severe and acute forms of choroidal inflammation should not be met with as a result of the poison developed in cases of auto-intoxication.

The association of choroidal lesions with disease of various important internal organs, e. g. the liver and kidneys, has been occasionally noticed and recorded, and the question has naturally arisen as to their exact relationship. While, from the evidence available, I do not think we can claim that a causal connection between disease of these or other organs and choroiditis has been established, a certain number of observations are on record which tend to show that the association is more than accidental. The question is not altogether an easy one to decide. Even if it can be shown that the association is usual it may be difficult to determine whether the disease of the organ affected and the choroiditis are to be considered cause and effect, or to be regarded as owning a common origin. To give an example, choroidal lesions have been noted in cases of chronic nephritis: in such instances it is probably more correct to say that the morbid condition in the kidney and choroid are both secondary to vascular degeneration, than to regard the choroiditis as induced by the renal disease.

It appears to me that analysis of some reported cases on these lines will leave us in doubt whether it is desirable in the present state of our knowledge to use the terms renal choroiditis and hepatic choroiditis, at least without qualification.

Choroidal changes associated with disease of the liver have received a good deal of attention from several recent writers in Europe, more especially Baas in Germany. This observer has described a variety of choroiditis met with in cases of cirrhotic disease of the liver to which he has given the name hepatic choroiditis: the condition so described has been accepted as a pathological entity by the writer responsible for the article on Disease of the Choroid in the *Encyclopédie Française d'Ophthalmologie* and at

least deserves further investigation. However, so careful an observer as De Schweinitz has been unable to satisfy himself of the occurrence of a form of choroiditis which can be considered specifically hepatic in origin.

The subject of choroiditis associated with disease of particular organs and the exact relations of the two pathological conditions constitutes one of the numerous lines of enquiry to which I referred in an earlier part of my address. Although it does not appear to me as promising a line to pursue, or as likely to prove helpful in the elucidation of the Etiology of choroiditis as others to which I have previously alluded, it should not be forgotten in our search for that increase of knowledge which will enable us to clear up much of the obscurity at present surrounding the subject we have had under consideration.

Now, gentlemen, I must not further tax your patience. I have in mind the lines by Pope: "Words are like leaves and where they most abound, much fruit of sense beneath is rarely found," and I should deeply regret if I gave you cause to quote them.

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THE PRESENTATION OF A NEW EYE DRESSING.*

J. LAWTON HIERS, M. D.

SAVANNAH, GEORGIA.

In practically every operation upon the eyeball or lids, we are obliged to use some form of covering or dressing. The same is also true in almost every form of injury to the eye and its appendages:

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therefore in the selection of a dressing for the eye, we should endeavor to choose one that will afford the greatest amount of safety and comfort to the patient, and that can at all times be held in position without the fear of its slipping or producing an increased pressure upon the eyeball. Especially is this desired where the eye has been operated upon for a glaucomatous condition; or where the globe has been opened either by an operation or an injury.

For many years I have avoided the use of the roller bandage—so familiar to us all; and have attempted to confine my eye dressing to some form of gauze pad, held in position by narrow adhesive strips.

Many advantages may be claimed for this form of dressing. The pad may be applied and removed with the greatest amount of ease, both to patient and attendant, and if the patient be in bed and permitted to turn from side to side, we need have no fear of the dressing getting out of position or producing an increased pressure upon the eye. On the other hand, if the patient is permitted to be up and around, this form of dressing is far less conspicuous, and, at the same time, does not interfere with the dressing of the hair. If the patient be a woman, this one advantage is too obvious to need more than a passing reference. The hat likewise may be worn without the slightest inconvenience.

For several years I have been using some form of hand-made pads of sterile gauze: but feeling that this form of dressing might be of interest to the profession, a little more than a year ago I took the matter up with the J. Ellwood Lee Company, and had them make for me the simple little pad which I here exhibit for your examination. It consists of twelve layers of surgical gauze passed through a tubular form of gauze mesh to hold them in position, and then cut in sizes, $2\frac{1}{4} \times 3$ inches for adults, and $1\frac{3}{4} \times 2\frac{1}{2}$ for children.

The pads come packed in small aseptic and hermetically sealed containers. I am informed by the manufacturers that they can be had at a price far less than the small roller bandage.

In conclusion, permit me to emphasize: Firstly: The importance of selecting an eye dressing that may be applied and removed with the greatest amount of ease both to patient and attendant; and moreover, to suggest the attendant does not necessarily have to be trained in ocular technique to be able to apply the pad with perfect ease and safety. Secondly: That there need be no fear of the pad getting out of position, and thereby producing an increased pressure on the eye. Thirdly: When a wet dressing is desired, the pad is

obviously much better than the roller bandage. Fourthly: When the patient is a woman, we should endeavor to select a dressing that will interfere as little as possible with her hair, especially in cases that may extend through many days of treatment.

SYMPATHETIC OPHTHALMIA OCCURRING THIRTY-
ONE DAYS AFTER THE REMOVAL OF THE
INJURED EYE.*

BY GEO. H. MATHEWSON, M. D.

MONTREAL.

It is with some diffidence that I bring this case to your notice, since it is by no means unique; but as it presents certain unusual features, I trust a short consideration of it may prove of some interest to you.

On the 22d of August, 1907, J. C. —, a well built man, 42 years of age, came to my office to consult with me with regard to his left eye, which was giving him a great deal of pain.

On examining the eye it was found to be blind, and had many scars on the cornea which was staphylomatous. The apparent cause of the pain was a fresh ulcer on the cornea. I ordered him appropriate treatment and told him to return the following day, but he failed to do so, and I saw no more of him until October 21—two months later—when he appeared at my clinic in the Montreal General Hospital with panophthalmitis of the left eye. He was at once admitted to the wards, and the eye was enucleated the following day. While in the hospital he gave the following history:

He was struck on the left eye by a flying piece of brass, while working as a machinist, twenty-one years ago. He says the fragment penetrated the eyeball and remained in it. After the injury the eye became red and very painful, and remained so for a long time. After this inflammatory attack, the eye was several times red and painful, and seven years later he was treated in Kingston for corneal ulcer in the eye, since which time he has had frequent attacks of pain in the eye. The vision of the left eye, which was poor from the date of the original injury, became much worse during the last two months and was entirely lost before he presented himself at the hospital. After the operation, which was attended with some difficulty, owing to the swelling of the parts and the friable condition of the eyeball, he made a rapid recovery

*Read at the Canadian Medical Association in Ottawa, June 11, 1908.

and left the hospital on October 29, one week later. The vision was 6/18 in the right eye at this time.

On November 23, 1907—just thirty-one days after the enucleation of the injured eye—he returned to the clinic with the complaint that during the day previous to his coming the right eye had become red and painful, and the eyesight had become bad.

On examining the eye one found considerable deep pericorneal congestion, a small pupil, with a small quantity of exudate within the pupillary area, and an anterior uveitis, with much fine opacity in the anterior part of the vitreous. The optic disc was normal. Vision was reduced to counting figures at ten feet. He was admitted to the ward and given mercurial inunctions, and hypodermic injections of pilocarpin daily. Locally 1 per cent Sol. of Atropin was instilled into the eye three times daily, and hot fomentations were applied to it every three hours. Under this treatment the pupil dilated evenly and to a moderate degree, but the redness did not diminish nor the vision improve. At the end of a week, as the pilocarpin did not produce satisfactory sweating, he was ordered a daily hot bath, which produced profuse perspiration. From the time that free perspiration was induced, improvement in his condition was rapid, and he was discharged with a round, well-dilated pupil, and a vision of 6/36, on December 30 last.

He had one or two slight attacks of congestion in the eye after returning to work in February, but his vision was not affected. On February 19 his vision was 6/18, and on June 5 was 6/18 and with \div 1.00 D. Spher. was 6/12.

The principal points of interest in the case seem to me to be:

(1) The length of time (21 years) between the injury to the left eye and the occurrence of the sympathetic ophthalmia in the right, i. e., if we consider the panophthalmia in the left eye to be due to a rekindling of the old focus of infection. Unfortunately the eyeball was so soft that it was badly torn in the process of enucleation, and was not kept as is our rule.

(2) The length of time between the enucleation of the injured eye and the onset of the inflammation in the other (31 days). Most cases on record occurred within two or three weeks after the enucleation (Snell's case (32 days) presents the longest interval between time of injury and onset of sympathetic ophthalmia that I could find).

(3) The fact that the offending eye was the seat of panoph-

thalmitis—which is generally believed to be very seldom followed by sympathetic ophthalmia.

(4) The good vision obtained and maintained after six months, although that is rather early to justify one in feeling perfectly safe.

(5) The evident good effect of the sweating and mercury.

PSEUDO OPTIC NEURITIS.*

THEODORE B. SCHNEIDEMAN, A. M., M. D.,

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A striking anomaly in the appearances of the optic nerves as observed with the ophthalmoscope has been recorded from time to time by different writers. The condition in question closely simulates inflammation of the nerve—indeed it is almost or quite impossible to differentiate it from true inflammation by the appearances alone. Repeated observations extending over a considerable length of time with careful testing of the functions are necessary to arrive at the proper diagnosis. The condition meant is not simply the slight blurring and somewhat veiled appearance of the disc, which are quite common, especially in uncorrected hypermetropia and astigmatism, but a much more marked anomaly. This consists of a decided prominence of the papilla (if it were really inflammation it would be called swelling), the outlines of which are very indistinct or even obliterated, so that the raised surface shades imperceptibly into the adjacent fundus; the color is heightened, the vessels are somewhat tortuous. In these respects the appearances hardly differ at all from true inflammation, so that the observer has at first no other thought than that he has before him true optic neuritis. The swelling of the disc is considered to be due to an exudate, but there are of course no hemorrhages. Subjective symptoms are, however, entirely absent, both visual and cerebral. Central vision is unimpaired and the fields show no contraction for form or color. The condition is congenital and has not been found to change during observation extending over years.

The anomaly in question would no doubt be more widely known were it not that, like opaque nerve fibres, it gives rise to no subjective complaints, and hence is not liable to come under ophthalmoscopic examination. On the other hand the condition has been frequently misunderstood, especially, as is well known, true optic-neuritis may occasionally persist for a considerable

*Presented to the American Academy of Ophthalmology and Otolaryngology, Cincinnati, August, 1908.

period, months and even a year, and more, without marked changes, or subjective complaints.

The writer has seen this well illustrated in a recent case of his own, in which the signs of true optic-neuritis (choked disc) persisted for more than a year with almost unimpaired central vision and but slight contraction of the fields, so that the patient and her friends were loathe to believe in the existence of a disease seriously threatening the sight, not to say life. And so no doubt many cases of the congenital anomaly must have been not rarely considered as true neuritis.

The writer has had the opportunity of observing two typical cases in sisters, covering in the one case a period of 13 years and in the other 9. The histories are briefly as follows:

E. S., aged 8, when first seen in 1895 was practically emmetropic with full vision. Pupils normal. Media perfectly clear. Right disc red, nearly circular, slightly prominent, about 1 D. above the surrounding fundus. The outline upon the nasal side quite obscured. Left disc presents the appearance of marked optic neuritis, which in fact was diagnosed. The outlines were almost entirely obliterated. Its prominence measures 2.5 D. above that of the surrounding fundus; it is "filled in," with no trace of a cup. The color is deep red and it is surrounded by a grayish area or halo extending into the neighboring retina; the vessels are slightly tortuous, but the normal relation between the diameters of the arteries and veins is preserved. The visual acuity equals 6/6. The fields are of normal extent.

The appearance of the optic nerve has remained unchanged since 1895, during which time the refraction has become myopic, 2.5D. in each eye, with slight astigmatism.

Case 2. M. S., sister of case 1, aged 9 when first seen, under observation at frequent intervals for 9 years. Right eye pupil normal, low hypermetropia, media clear, disc almost the exact counterpart of the sister's left. Vision 6/6, fields normal for form and color. Left eye, prominence of disc very slight, outline defined except for part of quadrant on nasal side. This disc is merely suggestive, hardly enough to attract attention, were it not for the marked appearance of the other eye.

A unique feature in these cases is their occurrence in sisters, a fact which strengthens the assumption of their congenital nature. Almost all reported cases to be referred to later gave evidence of other congenital ocular dystrophies, such as high hypermetropia, astigmatism, lenticular opacities, etc. None of which were present

in either of these. Case 1 has become moderately myopic during the period of observation.

De Wecker appears to have been the first to have called attention to the condition. He warns the ophthalmologist not to confound it, especially in children, with coincident febrile movement with beginning optic neuritis. Galezowski also figures a case in his atlas. The subject was affected with toxic amblyopia, the latter recovered entirely but the appearances of the nerve persisted. Galezowski ascribes the appearance to imperfect transparency of the fibers of the optic nerve. Harlan describes two cases, one of which was undoubtedly and the other possibly an instance of the anomaly. Elthoff found a similar condition nine times out of 1,800 subjects, while examining the eyegrounds of the inmates of an insane asylum. He adds that this occurred exclusively in conjunction with other congenital anomalies, particularly of the refraction. Dobrowolsky called attention to a hazy condition of the fundus with unimpaired transparency of the media in high degrees of hypermetropia; this haze did not affect the papilla alone and its immediate surroundings, but involved the entire retina so that these cases do not strictly belong to the anomaly in question, though related to it. He believes with others that the phenomenon is connected with strain of the accommodation, although the connection is not obvious. A similar condition has been described as following diptheritic intoxication. Bristowe has made perhaps the most exhaustive study yet published. He calls it the hypermetropic papilla or pseudo neuritis and states that it is a condition in which the disc appears covered by more or less haze, which affects particularly the nasal portion, although the entire nerve head may be involved, accompanied by such a degree of swelling that the vessels assume a tortuous course. As a proof that true neuritis is not present the appearance does not change, and all cerebral symptoms are absent. Of 125 hyperopes examined by him, twenty-nine showed the hypermetropic papilla. There was no definite connection between the degree of the hypermetropia and the presence or extent of the anomaly. Like Landolt, Donders and others, he regards the hypermetropic eye as an undeveloped organ, but he does not agree with Landolt that the hypermetropic papilla is due to a defect in the nervous apparatus, seeing that the visual acuity is generally normal. Bristowe agrees with Loring that the appearance is due to an excess of connective tissue elements causing the papilla and the adjacent retina to suffer in transparency and giving the appearance of radiating lines. Marcus Gunn has also described

hypermetropic congestion of the papilla. Spicer records a case of 3 D. swelling of the disc with indistinct outlines in an emmetropic boy, which he observed for 3 years without change. In the discussion upon this case Hartridge refused to admit the term spurious and thought that Spicer's case was one of protracted optic neuritis. Spicer correctly observed that it is unthinkable that such a delicate structure as the optic nerve should be subject for a number of years to disease without occasioning the slightest disturbance of function.

Burkholder, in a paper entitled, "Fundus Lesions with Normal Vision," records several cases of pseudo papillitis which were at first believed to be true inflammation, and treated accordingly.

Konigsberg has also called attention to the resemblance the optic discs occasionally show in hypermetropia and hypermetropic astigmatism to optic neuritis, which may be increased by combination with tortuosity of the vessels, or by hyperaemia of the disc in febrile conditions.

Faith records a case in a girl with short sight and hysteria who presented a pair of swollen discs, with blurred outline, which simulated in appearance optic neuritis.

Nottback has published an exhaustive article upon the subject, reporting a number of cases.

It appears then that a condition of the optic nerve simulating the appearances of inflammation occasionally occurs. Those who have never seen it are disposed to doubt its physiological or congenital nature and deny the correctness of the designation "spurious," but where such a condition has been observed to remain unchanged for many years with entirely unimpaired function, it is impossible to admit the existence of true inflammation. The occurrence of the same anomaly in two sisters, as here, is, to say the least, highly suggestive of a congenital origin. It is also suggestive that the refraction in one of these cases was hypermetropic and the other myopic, tending to show that it is independent of the refraction.

POST OPERATIVE SYMPATHETIC OPHTHALMITIS.*

DON M. CAMPBELL, M. D., L. R. C. S. (EDIN.).

DETROIT, MICH.

A somewhat exhaustive review of the literature of sympathetic ophthalmitis both in the standard text books and in current ophthalmic periodicals fails to unearth much information on the subject in its relation to operative cases.

*Read before the American Academy of Ophthalmology and Otolaryngology Cleveland, Ohio, August, 1908.

Indeed, this phase of the subject in many publications is touched upon not at all, while in others it is but briefly referred to. Is this due to a reluctance of operators to report such cases or are they ~~very~~ rare?

No doubt many ~~cases~~ occur which do not reach the light of publication.

In such an important matter this is ~~unfortunate~~ because the accumulated mass of all our experiences in *this direction* would at least be interesting and perhaps instructive.

The pathology of sympathetic ophthalmitis and the method of transmission from one eye to the other is far from clear. The various well known theories of its path of invasion from one eye to the other lack scientific verification in pathologic findings in the tissues supposed to be traversed by the so-called passage of the inflammation from one eye to the other.

Thus the theory of the optic nerve and chiasma is not substantiated by pathologic findings in the tissue supposed to have been traversed by the pathologic organism.

Furthermore, excepting in very exceptional cases the pathologic process in the secondarily affected eye does not begin at the optic disc. The same lack of pathologico-anatomic confirmation is found in the ciliary nerves.

The theory of a reflex nervous mechanism at work seems to the writer entirely untenable in our present conception of organic pathologic changes.

The theory which seems to best explain the existence of sympathetic ophthalmitis is one of infection followed by general systemic invasion—the latter condition being the exciting cause of the inflammation in the secondarily affected eye. This view of the matter seems to be borne out by:—

1st. The existence of a special form of pathologic change found in the exciting eye. Fuchs, without knowing the history of the cases, was able out of a large number of enucleated eyes to select 29 eyes which he considered presented the special pathologic change in the uveal tract which should be followed by sympathetic ophthalmitis.

Lo and behold, it was found that those cases all had produced sympathetic ophthalmitis and that out of the many eyes examined they were the only ones so acting. ("On new results in the study of sympathetic ophthalmitis," by Dr. G. Lenz-Breslau.)

Could there be any more convincing proof that there must be a special pathologic condition in the exciting eye? This in-

flammation has the characteristic of an endogenous infection and is anatomically characterized by dense infiltrations in the uveal tract and not by exudates on the internal surface of the eyeball. (Fuchs.)

The special micro-organism has as yet not been demonstrated, but it seems fairly clear that it is not one of the pus-producing germs.

Now it seems fairly clear, also, that this mass of infiltration in the vascular coats of the eye ball affords an excellent supply depot for the invasion of the general circulation by the special infectious agent which produces the sympathetic ophthalmitis.

2d. The indisputable evidence of a mild general infection, as evidenced by more or less profound general constitutional depression, malaise, loss of appetite. Elevation in temperature, and pulse, great pain around the exciting eye and a peculiar prickling sensation out over the distribution of the ophthalmic division of the fifth nerve.

In all the cases of sympathetic ophthalmitis that I have been able to observe, clinically these symptoms were certainly present. The patients were sick; they all felt badly depressed; they all had elevated temperatures from 102° to 104° Fahrenheit: they all had pulse acceleration, and they all presented great pain in the exciting eye: and furthermore, they all manifested the peculiar symptoms of prickling of the cutaneous distribution of the ophthalmic division of the fifth nerve. These symptoms will be referred to in case reports to follow.

It would seem to the writer that some valuable information relating to the early recognition of an impending sympathetic ophthalmitis might be obtained by a systematic series of blood examination in these cases. An early leucocytosis would probably be found in impending cases.

3d. The result of treatment carried out in accordance with modern ideas strangely enough offers a sort of confirmatory proof of a general infection being at the bottom of the cause of sympathetic ophthalmitis. It is necessary in order to understand this phase of the subject to refer briefly to Nature's method of counteracting and expelling from the body an infection.

It is clearly established that this is accomplished by a process known as leucocytosis or increase in the white blood cells, whose function it is to take care of and destroy the invading organism in the various infections.

Now, furthermore the very best modern method of combating

sympathetic ophthalmitis is the heroic exhibition of sodium salicylate, according to the method of Gifford.

Why sodium salicylate should control sympathetic ophthalmitis or any other infective inflammatory manifestation in the uveal tract or sclerotic coat was for many years to the writer an unanswerable conundrum, until experimentation with blood counts, before and after its exhibition revealed the fact that an immediate and constant result of its exhibition was found to be a raising in the number of white blood cells.

In other words, it is an agent which might be said to produce a medicinal leucocytosis.

Its favorable action is not so much due to its antiseptic qualities or its so-called anti-rheumatic effect, but rather due to this power of raising artificially the power of the blood to fight infection and "a priori" any disease which is uniformly and decidedly improved by its exhibition is probably due to some form of infection.

The application of this thought to the subject under consideration is obvious.

It would seem that the search for a special avenue of passage of the pathologic agent from one eye to the other has not only been fruitless, but even unfortunate, inasmuch as this blinded the eyes of investigators to the more obvious solution and delayed the working out of an effective plan of treatment.

CLINICAL REPORTS OF CASES.

In a clinical and private practice extending now over twenty years, I have seen six cases of sympathetic ophthalmitis. A brief history of each case I herewith present:

Case I. Mr. G., a railroad worker, was struck in the eye by a piece of iron from the head of a hammer. Six days after the accident he came under my observation and the eye was found to present a fine corneal-scar. The point of entrance of the missile, a traumatic cataract and a moderate degree of inflammatory reaction. Magnet reaction to pain and the skiagraphs, both indicated the presence of a foreign body retained within the eyeball, and it was decided to institute operative proceedings for its removal.

The following operation was done: A corneo-scleral incision was made as for cataract extraction; small iridectomy was done; the cataract removed and a small tip of the Hirschberg magnet introduced slightly into the lips of the wound, and when the

current was turned on a scale of iron immediately came to the magnet tip and was easily removed.

No vitreous was lost. The wound angles were freed from iris tissue, and the usual toilet carried out.

Healing was not kindly; great inflammatory reaction resulted. The patient suffered intensely with pain and complained bitterly of a numb, prickling sensation over the brow, following the distribution of the supra-orbital branch of the ophthalmic division of the fifth nerve.

Between three and four weeks after the operation this man showed some slight evidence of sympathetic ophthalmitis, and in spite of the fact that the offending eye was immediately enucleated, in a few days he was in the middle of a severe attack of sympathetic ophthalmitis, which eventually destroyed his eye completely.

This case occurred some ten years ago. Rest in bed, mercury and atropia constituted the treatment, and it was entirely ineffectual in staying the progress of the disease.

A retrospective view of this case in the light of a richer experience shows the weak spots in its management. While the technique of the operation for the removal of the steel was good, the method was wrong. **The steel should have been removed through a scleral puncture, and the cataract dealt with later on.** The modern dark room and salicylate of soda treatment would have offered better chances of recovery after the sympathetic ophthalmitis had once started than that which was available at that time.

Case 2. Master L., aet. 10, was struck in the eye with a piece of copper from an exploding gun cap, which passed through the cornea, lens and iris, and lodged in the vitreous. An unsuccessful attempt was made to remove the foreign body and immediate enucleation was advised, but rejected. In three weeks a sharp attack of sympathetic ophthalmitis occurred, and in spite of immediate enucleation and the vigorous application of the existing form of treatment—atropine, rest in bed and mercury—this eye went on to complete destruction and total blindness.

In this case, as in case No. 1, there was great pain about the exciting eye and the symptoms of prickling over the distribution of the ophthalmic division of the fifth nerve was very well marked.

There was a decided rise in temperature and well marked symptoms of general depression; strong and unmistakable evidence of constitutional poisoning from the infection. Of course, an

earlier enucleation would have prevented the sympathetic ophthalmitis or the salicylate of soda treatment might have controlled it, after it was once established.

Case 3. A more recent experience. This man had a senile cataract for which the operation of simple extraction was done. Two days after the operation a complete prolapse of the iris was found which was dealt with in the usual manner.

Severe inflammatory reaction resulted and in four weeks sympathetic ophthalmitis developed in the fellow eye. Inasmuch as there was considerable vision in the eye, from which the cataract had been removed, it was not enucleated, but the patient was put in a dark room and subjected to the salicylate of soda treatment according to the method of Gifford and made a fairly good recovery, a useful amount of vision being retained in each eye.

Case 4. Baby W., had ophthalmic neonatorum, which came under observation at the end of the second week. At this time the cornea of the right eye was necrotic. Under appropriate treatment healing took place and when the child was $4\frac{1}{2}$ months old a Mules operation was done on account of a large anterior staphyloma of the right eye. The healing was uneventful and the cosmetic effect was exceptionally good. Nothing was heard from this eye until the child was $2\frac{1}{2}$ years old, when, without any known cause, it became irritated. In the next year this was repeated several times, but always subsided under treatment.

During each of these attacks there was always manifest in the other eye marked symptoms of sympathetic irritation, but no inflammatory symptoms. However, finally when the child was $3\frac{1}{2}$ years old, a severe attack of inflammatory reaction occurred in the stump and sympathetic inflammation occurred in the other eye. This was not of the plastic irido-cyclitis type, but of the form characterized by moderate redness of the sclera contraction of the pupil, photophobia and lachrymation and a clearly defined ophthalmoscopic picture of optic neuritis. The stump was promptly enucleated, the child put in complete darkness and given sodium salicylate, and the recovery was prompt, complete and permanent.

Case 5. E. O., a mechanic, received a penetrating wound of the corneo-scleral margin, resulting in prolapse of the iris, and opacification of the lens. Exposure to the giant magnet and a skiagraph failed to indicate the retention of the missile which had done the damage. The iris was freed from the corneo-scleral wound and a small iridectomy performed. Reaction was marked,

great pain and tenderness. General depression and a half degree of elevation of temperature was noticed. A moderate degree of numbness and prickling over the distribution of the ophthalmic division of the fifth nerve was observed in this case.

There was a moderate degree of photophobia and a perceptible degree of lowering of the power of accommodation of the fellow eye. Five weeks after the original injury, the injured eye still presenting marked signs of inflammation, it was enucleated, and in a few days after the operation the patient left the hospital and returned home. In exactly three weeks from the date of the enucleation, the patient returned with a well marked plastic irido-cyclitis, pupillary adhesions and greatly reduced vision.

A typical picture of sympathetic ophthalmitis of fairly severe type was presented by this eye. The diagnosis was made first by the history; second, the typical type of inflammatory reaction shown in the eye; third, the exclusion of all other possible causes of irido-cyclitis; these included trauma, extension from surrounding areas of inflammation—rheumatism, syphilis, tuberculosis and any other possible infective process in the body, excepting that originating from the eye which had been enucleated.

I might add that the healing after the enucleation had been entirely uneventful, and that the recovery from the sympathetic ophthalmitis was complete and permanent under the Gifford method of treatment.

Case 6. W. H., a farmer, was struck in the left eye by a splinter of wood, producing a perforating wound of the cornea, and traumatic cataract. Three weeks after the injury he came under observation. The eye was much inflamed, great pain, and a moderate degree of prickling over the fifth nerve. This patient was greatly depressed, confined to bed and had temperature varying from 99 to 100 degrees Fahrenheit, with elevation of the pulse. A linear extraction of the swollen lens matter was performed, but was not followed by any appreciable amelioration in either the constitutional or local symptoms. The injured eye was enucleated and after a week the patient was allowed to return to his home.

In exactly three weeks from the date of the enucleation the fellow eye suddenly became violently inflamed and a few days later he was returned to me practically totally blind. An examination showed a plastic irido cyclitis of a very violent type and numerous posterior synechia. The diagnosis of sympathetic ophthalmitis was easily made by the clinical picture presented, by the history

and by the exclusion of all possible causes excepting that of sympathy.

After a protracted course of heroic treatment by the Gifford method this man likewise made an absolutely perfect recovery, which since has so remained.

Cases 1 and 2 illustrate the result of treatment fifteen years ago. Cases 3, 4, 5 and 6 are illustrations of the better results now obtained by atropine, complete and total darkness, and one grain per pound of the patient's bodily weight per day of a reliable preparation of sodium salicylate.

Now in conclusion, what can briefly be said of this disease seems to the writer to be about as follows: Post-operative sympathetic ophthalmia is not an extremely rare occurrence. 2d. There is a special anatomic pathologic condition, the occurrence of which in an injured eye will surely produce sympathetic ophthalmitis in the other eye. 3d. The search for a special route of passage from one eye to the other is fruitless and unimportant. 4th. The evidence of a general systemic infection being at the bottom of the difficulty is fairly conclusive. 5th. There is a train of symptoms—objective and subjective—which are fairly convincing of the immediate probability of an impending sympathetic ophthalmitis: they are violent inflammatory disturbances in the injured eye accompanied by the evidence of infiltration in the uveal tract; clinically this is best shown by muddiness, thickening of the iris and tenderness over the ciliary region, great pain, a prickling or numb feeling over the distribution of the ophthalmic division of the fifth nerve, especially the supra-orbital branch. Constitutional Symptoms, such as one would expect to find in a general systemic infection, such as general depression, malaise, loss of appetite, moderate elevation of the bodily temperature and pulse rate, and later on the well-known signs of inflammation in the fellow eye. 6th. The result of modern methods of treatment is much superior to that employed fifteen years ago.

Furthermore, it would seem to the writer that some progress can be made in the earlier diagnosis of the impending outbreak in the fellow eye by a study of wounded eyes by means of transillumination, so as to become more familiar with the normal and abnormal shadows; from this method we may be able to detect the influence of the greatly infiltrated uveal tract on such shadows of transillumination. A refinement of skiagraphic technique may also offer us something in this direction.

There is also a further possibility of progress in this direction

by the study of the blood conditions of patients with wounded eyeballs. Any progress towards early diagnosis in this disease will be hailed with delight by anybody who has had to deal with such distressing problems as are presented by sympathetic ophthalmitis.

SYMPATHETIC OPHTHALMIA FOLLOWING MULES' OPERATION.

BY CHAS. H. BROBST, M. D.,

PEORIA, ILL.

On October 20, 1903, a boy, 10 years of age, while attempting to skin a muskrat with a sharply pointed knife, which in some manner slipped for him while cutting upward, the blade penetrated the left eyeball, inflicting a wound 1½ centimeters long on the nasal side, completely bisecting the ciliary body and iris and the wound extending to the center of the cornea.

I saw the boy about 10 hours after the accident had happened. There was no prospect of saving the eye, from the fact that there had been some prolapse of the vitreous. I therefore completely eviscerated the contents and implanted a glass ball without any further complications whatsoever. The patient progressed nicely and after one week was discharged from the hospital.

I saw him again on the 12th of November. Condition of both eyes seemed to be normal. I did not see the patient again until December 18th, when he was brought to my office complaining of indistinct vision in his right eye, painful to touch and the ophthalmoscopic examination revealed an optic neuritis due to a sympathetic irritation. The stump of the left eye was also painful to touch and congested, and vision in the right eye was 20/60. I immediately removed the remainder of the left eye and made deep injections into the stump of the optic nerve of a solution of cyanide of mercury 1/500, and repeated this on the third day. On the 7th day the vision of the right eye began to clear up and steadily improved and when the patient was discharged from the Hospital January 14, 1904, vision was 20/30, and the last time I saw him, on April 1, 1904, his vision was normal, or 20/20.

Now this is a clear case of sympathetic ophthalmia, subsequent to an implantation of a glass ball, and I had all reason to surmise, had I enucleated the ball at the time I performed the Mules operation. I would not have had the sympathetic ophthalmia in this case.

ON SYMPATHETIC OPHTHALMIA AFTER EVISCERATION AND MULES' OPERATION, WITH A CASE.*

BY H. GIFFORD, M. D.,

OMAHA, NEB.

The text for this article is furnished by the following case: J. M., aged 45, struck on right eye on a sun-flower stump about September 15, 1903. He was seen by me six weeks later, with a large triangular scar from a perforating wound in the sclera, down and out from the cornea; anterior chamber shallow, lens cloudy, no reflex from fundus, deep congestion, projection faulty. As, in spite of treatment, the congestion continued, Mules' operation was performed December 17th, a glass ball being put through an opening in the sclera above the cornea and the cornea left in place. He returned July 28, 1904, saying that the other eye, which was normal when I first saw him, had become sore and the sight somewhat dim, three days previously. No premonitory symptoms nor trouble of any kind with the stump. I found the latter to be in apparently excellent condition without any signs of irritation. The left eye showed slight but widespread, deep congestion, iris discolored, pupil nearly secluded and yielding very little to atropine. Vision, with correction, 20/100. The stump was enucleated at once and under active treatment with salicylate of sodium the left eye rapidly cleared up, so that at the end of the month he was able to go home with vision almost normal. He had no further trouble until January 26, 1905, when his sight suddenly got dim over night, after a hard day's work. Three days later he returned to me and I found him to have acute glaucoma, cornea hazy, fundus indistinct, tension +1. An iridectomy promptly reduced the tension and improved the sight, his vision in May, 1905, being 20/30, a little minus. In June his tension again went up slightly and I did a sclerotomy. But on July 17th he returned with the eye red and paining him slightly; vision, 20/70, not improved; tension a little high; slight opacities in lens and vitreous. In September, as the tension was still slightly elevated, another sclerotomy was done. Following this, although there was no marked inflammation, the eye remained congested; a solid immovable exudate collected in the anterior chamber, and the lens gradually became opaque. In spite of all treatment the exudate in the anterior chamber continued to increase, and by June 8, 1906, the cornea was nearly all of a yellowish hue, only a small portion in the center being moderately clear, nothing but whitish exudate to be seen in anterior chamber. When last seen, in 1907, the globe was small and soft

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and light perception doubtful. (The specimen, sad to say, was lost during an office-moving.)

In this case, although the man apparently got over his sympathetic ophthalmia, the unusual course which the subsequent glaucoma pursued, makes me believe that it was influenced by the preceding inflammation, and that if he had not had the sympathetic trouble he probably would not have lost his sight from the glaucoma.

It makes a great difference whether one of these rare accidents occurs in a man's own practice or in that of some one else. Reading about such things produces very little effect. Like lightning flashes, they do not seem worth worrying about. But when a man has one of his own patients go blind, after a somewhat unorthodox operation, it is hard to escape some remorse at not having stock more closely to conventional lines. In endeavoring to decide whether Mules' or any other implantation operation is justifiable, I have collected the following cases of

SYMPATHETIC OPHTHALMIA AFTER MULES' OPERATION.

The original and famous cases of Cross (*Ophthal. Review*, 1887, p. 236) are the following:

1. Mules' operation, seventeen days after wound of the eye. Seventeen days after the operation, vision of the other eye dull and eye uncomfortable: two days later "distinct sympathetic ophthalmitis." Glass ball removed at once, eye much inflamed and painful for a fortnight. Left the hospital five weeks after the removal of the ball with some congestion and irritation remaining. Later, eye normal. [No vision given at any time.]

2. Mules' operation, with a metal ball, performed three months after wound. Considerable reaction. Ball exposed through small fistula 12 days later. Ball removed at once: patient left hospital in ten days, but returned a few days later with vision equal to 20/40, slight circumcorneal congestion, sluggish pupil which yielded to atropine, "leaving slight uvea" [*sic.*]: vitreous-hazy, distinct neuro-retinitis. In this case the sympathetic ophthalmia showed itself 21 days after the operation, the symptoms subsided after ten weeks of treatment. "These cases were considered to be analagous to those of sympathetic ophthalmitis occurring after and in spite of enucleation and not caused directly by the operation." Cross does not state what was done with the stump in the second case, but apparently it was not removed.

3. Coleman's case (*Ophthal. Record*, June, 1899, p. 307). Mules' operation was done six days after the injury: seven weeks

later some of the glass could be seen and edges of sclera freshened and reunited, but stitches gave way. Eight days after the second stitching, the other eye showed marked sympathetic ophthalmia. Final vision, 20/30. It is not stated just what happened to the glass ball in this case, but the context leaves little doubt that it escaped. The stump was not removed.

4. Faith (*ibid*) in the discussion of Coleman's case, refers to a case of Bettman's in which iridocyclitis followed Mules' operation, necessitating enucleation of the stump. No further particulars.

5, 6 and 7. In the report of the Committee on Excision of the Eyeball, etc. (Trans. Ophthal Soc., United Kingdom, XVIII), mention is made of Cross' first two cases, together with three more, as follows: (a) Charnley, Mules' operation about a month after wound; one month later, decided sympathetic ophthalmia with final vision 6/18; ball not taken out. (b) Cross' third case, Mules' operation three weeks after wound; 35 days later patient returned with iridocyclitis, and V.=5/60. He stated that eye got sore and dim about 15 days after the operation. Stump removed and eye gradually recovered. Two months later V.=5/6. (c) Bickerton's case, Mules' operation 24 days after wound; 25 days later mild sympathetic ophthalmia set in in the other eye. Vision after a week, 6/5. No further particulars nor mention of stump being touched.

8. Suker, personal communication to de Schweinitz (Report on Enucleation, etc., Internat. Oph. Congress, 1900), Mules' operation performed 18 days after wound; 10 days later, iridocyclitis of other eye began. Stump enucleated, ultimate vision, 20/80.

9. Carrow, letter to de Schweinitz, loc. cit. Mules' operation followed by sympathetic ophthalmia in the other eye. This recovered after enucleation of the stump. The original operation in this case was done for an extensive corneal and scleral staphyloma, which in itself was not causing any signs of sympathetic ophthalmia. De Schweinitz also mentions two cases of sympathetic trouble after Mules' operation reported to him by Hobbs, but without enough particulars to make them available.

10. Thompson (Trans. Amer. Oph. Soc., X), in a discussion of Satter's case of sympathetic ophthalmia after Frosts' operation (p. 337), mentions a case observed by him at the Manhattan Eye and Ear Infirmary, where, 40 days after Mules' operation a low grade of iritis developed and made no improvement until the stump was removed, then prompt recovery.

11. Byers (Brit. Med. Jour., December 29, 1906). Mules' operation forty days after wound: two weeks later moderate serous cyclitis, followed two months later by neuro-retinitis. Course prolonged but final V.=6/9, in part. "The eye is comfortable and capable of doing a considerable amount of work." Apparently the ball was left in the stump and nothing done to the latter.

12. Ziegler (OPHTHALMIC RECORD, August, 1908, p. 310) in a discussion speaks of a case of sympathetic ophthalmia observed by him three months after Mules' operation.

13. Goldberg (OPHTHALMIC RECORD, August, 1908, p. 305, and personal communication), following an injury, eyeball eviscerated and gold ball implanted). Seven weeks later the other eye became inflamed and ran the ordinary course of a severe sympathetic ophthalmia, in spite of treatment and repeated operations. Vision only light perception at time of discharge. (I find that this case has also been reported at the Pan-American Congress in 1907, by Oliver, who has kindly allowed me to see his manuscript.)

Beside these cases there should be mentioned an instructive case of sympathetic irritation after Mules' operation, reported by Linn Emerson (OPHTHALMIC RECORD, 1907, p. 496). His patient had serious irritation of the other eye, persisting some time after the operation, but ceasing promptly when the ball, with a few drops of straw-color fluid, was removed.

In order to have some basis for estimating the danger of Mules' operation as compared with ordinary evisceration and the Frost operation, I have searched the records for cases of sympathetic ophthalmia after these operations, with the following results.

SYMPATHETIC OPHTHALMIA AFTER FROST'S OPERATION (IMPLANTATION OF SOME SORT OF BALL INTO TENON'S CAPSULE).

I have only found three cases of this sort, two are mentioned in the report on excision (Trans. Oph. Soc. United Kingdom, XVIII). (a) Cant's case. Frost's operation performed third day after wound: three days later globe came out and second eye felt weak and watery: the next day, iritis, which ran into typical sympathetic ophthalmia: result not given. (b) Lang's case. Old atrophic stump removed and glass ball put in: eight weeks later patient returned with sympathetic ophthalmia: final result bad. Anterior chamber shallow, pupil irregular V., fingers at 4 feet. The other case is that of Sattler (Trans. Am. Oph. Soc., X, p. 337). Eye enucleated 15 days after wound, glass ball put in. Forty-eight days later, pronounced neuro-retinitis, with mild

nveitis. Patient was helpless from loss of sight; ball and $2\frac{1}{2}$ cm. of nerve removed at once; 40 days later, V.=6/10.

To these may be added Davis' case of sympathetic irritation after Frost's operation (*Jour. Am. Med. & Med. Assoc.*, July 20, 1907, p. 215). The patient had had a paraffine ball put into Tenon's capsule about a year before he was seen by Davis. All went well for about ten months, when the artificial eye which he wore began to turn in and the other eye began to be congested, painful and watery. This kept up for 6 or 8 weeks, when Davis operated and found the paraffine in a single mass at the posterior end of the orbit. This was removed and the symptoms disappeared at once.

SYMPATHETIC OPHTHALMIA AFTER EVISCERATION WITHOUT ARTIFICIAL VITREOUS.

The English committee on excision, already referred to, were not able to find any cases of sympathetic ophthalmia after the ordinary evisceration, nevertheless some had been reported at that time and others have been reported since.

1. Drausart (*Rev. gen. d'Ophthalmologie*, 1886, p. 505) in a discussion in the French society mentions having had one case of "transmission sympathique" after evisceration. No further particulars are given, but as he speaks of it with regret, the case was probably serious and the outcome bad.

2 and 3. Schmidt-Rimpler (*Deutsch. Med. Woch.*, 28, 1900, p. 151) reports the following: (a) Evisceration 14 days after wound; two years later moderate iritis, with spots on Descemet and opacities in the vitreous, vision reduced to 2/12; stump removed; final result, V. = 6/8. Although this case is somewhat doubtful on account of the long period which elapsed, Schmidt says it gave decided impression of a sympathetic disease. (b) Evisceration one month after accident; 49 days later vision began to get hazy. He returned to the hospital about a month after the operation with moderate sympathetic ophthalmia, V. = 1/3; final result, V. normal.

4. Waldispühl (*Unaug. Diss. Basel*, 1892) mentions a case which occurred in the clinic at Basel, in which a patient upon whom an evisceration had been performed, returned four months later with pronounced sympathetic ophthalmia. In spite of enucleation of the scleral stump and all the ordinary forms of treatment the condition kept getting worse, and although there is no exact statement of the final result, the eye must have been practically

lost. In the enucleated stump *staphylococcus albus* and citreous were found.

5. Van Duyse (*Arch. d'Oph.*, 1893, p. 197) in a book-review, reports a case of his own in which evisceration was done four days after a post-operative irido choroiditis had developed. At the end of three weeks sympathetic ophthalmia appeared in the other eye and it was lost, by this disease.

6. Forget (*Arch. d'Oph.*, p. 693) mentions a case of optic neuritis occurring 19 months after evisceration. Result (?).

7. Hotz (*Trans. Oph. Sec. Am. Med. Assoc.*, 1893, p. 93) reports a case of mild optic neuritis occurring about three weeks after an evisceration and recovering without the stump being removed.

8. Nieden in a report to Pflüger (*Corr. bl. für Schweizer Aerzte*, 1896, 1) describes a case in which he performed evisceration four weeks after a wound; 14 days later sympathetic ophthalmia appeared; result not given.

9. De Wecker (*Ann. d'Oculist.*, October, 1889, p. 197). Evisceration nearly three months after wound; three weeks later sympathetic ophthalmia developed, stump enucleated with as much as possible of the nerve, but nothing modified the pernicious and destructive course of the disease.

There remains to be mentioned an isolated and doubtful case of
SYMPATHETIC AMBLYOPIA AFTER ORDINARY EVISCERATION.

Reported by Burchardt. An evisceration was done and the patient returned after two years with the other eye objectively entirely normal, but with vision on 1/21. The stump was removed and vision arose to 3/12. This case is doubtful from the fact that there is no record of the vision before the evisceration, and it should also be considered that the pain in the head and orbit (and, perhaps, also the poor vision) of which the patient complained may have been caused by her habit of probing the lachrymal canal daily, and apparently leaving the probe in through the day. This practice was stopped at the time the stump was enucleated.

De Schweinitz (*loc. cit.*) mentions two cases of

SYMPATHETIC IRRITATION AFTER ORDINARY EVISCERATION.

one by Casey Wood and the other by Suker, in which troublesome symptoms persisted for some time, but gradually disappeared without the stumps being removed.

To sum up, we have fourteen cases of sympathetic ophthalmia, after Mules' operation, nine after ordinary evisceration, and three after Frost's operation.

With regard to the severity of the disease: Of the cases after Mules' operation, vision of 20/30 or better was obtained in nine cases; in two the final vision was 20/60 and 20/80, respectively; in two, it is unknown, while in two of the eyes the sight was nearly destroyed.

In the cases after ordinary evisceration, the final vision was unknown in three; in two it was normal; in one it was 6/8, while in three the sight was lost.

In the three cases after Frost's operation the outcome was uncertain in one; in one the final vision was 6/10, and in one, fingers at 4 feet.

In the great majority of all these cases the operation was done for persistent inflammation, following some wound, and of most of these it may be said that the sympathetic ophthalmia might have occurred just the same, even if a simple enucleation had been performed; but there remain seven cases to which it does not seem reasonable to apply this explanation. These are: (a) The case of Carrow, where Mules' operation was done for a staphylomatous, but not inflamed eye; (b) that of Lang, in which an old, atrophic stump was enucleated and a glass ball put into Tenon's capsule; (c) my own case, in which the disease appeared more than seven months after Mules' operation; (d) and (e) those of Forget and Schmidt-Rimpler, in which sympathetic ophthalmia appeared 19 months and two years, respectively, after ordinary evisceration; (f) that of Cant, in which Frost's operation was done three days after the injury and the sympathetic ophthalmia appeared four days later; (g) that of Van Duyse, in which, to save the patient the pain of panophthalmitis, an ordinary evisceration was done four days after an infectious irido-choroiditis following cataract extraction had set in. In the first five of these, and perhaps in the sixth, the evisceration stump itself may reasonably be held responsible for the sympathetic ophthalmia, while in the last two it is almost certain that an enucleation would have prevented the trouble.

In view of the uncertainty as to the comparative frequency with which enucleation and its substitutes are performed, there is no use in pretending to anything like accuracy in estimating their comparative dangers, but considering the immense preponderance of enucleation (following which about 35 cases of sympathetic ophthalmia have been reported since evisceration came in), I think it is clear that the statistics, as well as theoretical consideration, indicate that enucleation as a prophylactic against sympathetic

ophthalmia is somewhat surer than any operation in which part of the eyeball or any foreign body is left in the orbit or scleral cavity. I think it also certain that ordinary, or simple evisceration is safer than Mules' or Frost's operation.

I do not think it likely that the publication of these figures will make any difference in the number of Mules' and Frost's operations that are done. The argument will be used that an occasional sympathetic ophthalmia should no more set our faces against these operations than that the blindness from quinine and salicylate should prevent our using these drugs, but the parallel does not hold. With quinine and salicylate we save many lives and eyes, while with the substitutes for enucleation we run a slight risk of losing sight for the sake of an improvement in looks, which, in comparison with the results obtained, by enucleation, careful prothesis and the wearing of glasses to minimize the deformity, is very slight. To be frank, I do not think that my own practice would be much influenced by this series of cases if they were reported by some one else, but having had one of these accidents myself, I should feel like a criminal if I were to go on doing Mules' operation or Frost's operation and should have a second patient go blind after one of them: and I should throw over the simple evisceration also if I did not believe it to be slightly less likely to cause death than enucleation is.

In conclusion I submit the question, "Is it more than fair to our patients to at least give them the chance of deciding for themselves whether they prefer to incur a slight risk of losing sight for a slight improvement in looks?"

[Since this paper was read I have learned of two other cases of sympathetic ophthalmia following Mules' operation, of which the particulars have been kindly furnished me by Dr. H. G. Sherman, of Cleveland, Ohio, and Dr. Charles H. Brobst, Peoria, Ill. In Dr. Sherman's case a Mules operation was followed by a very violent reaction, the whole orbital tissue being infiltrated with pus, necessitating evisceration of the orbit within a week after the operation. Six weeks later the other eye developed sympathetic ophthalmia, and the vision was finally reduced to ability to get about. This is a unique case, and it might be a question whether it should be placed under sympathetic ophthalmia after Mules' operation, after enucleation, or after evisceration of the orbit. Dr. Brobst's patient was a boy of ten years, who cut his eye so badly that the doctor did a Mules operation ten hours after the accident. About two months after he was brought back

with a marked optic neuritis, V.=20/60, which improved after enucleation of the stump so that normal vision was ultimately obtained. Further particulars of this case are given in Dr. Brobst's paper in this issue of the OPTHALMIC RECORD.]

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CLINICAL HISTORY AND HISTOLOGIC STUDY OF A
CASE OF TRANSFERRED OPTHALMITIS FOL-
LOWING THE INSERTION OF A GOLD BALL INTO
THE SCLERAL CAVITY—EXNUCLEATION—
RECOVERY WITH USEFUL VISION.*

By CHARLES A. OLIVER, A. M., M. D.,

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In 1903 a middle-aged miner was sent to me at my clinic at Wills' Hospital.

Seventeen weeks before my seeing him he was struck in the right eye with a piece of coal. The foreign body was removed from the anterior chamber of the eye the third day after the injury.

Three weeks after this Mules' operation was performed upon the right eye at the hospital situated nearest to the patient's residence. Seven weeks later the left eye became inflamed.

When I first saw the case there was a classical picture of transferred ophthalmitis. The secondarily involved eye showed both tarsal and ciliary congestion. The anterior chamber was shallow. The pupil, which was blocked, was contracted to the size of a millimeter. The iris-tissue was degenerate. Tension, fortunately, was but slightly below normal. The field of light-perception was not much reduced.

The remaining portion of the right eye containing the artificial globe was tender. Its movements were impeded. The conjunctiva was filled with granulation material, and there was a profuse mucous discharge.

After consultation with two of my colleagues (Drs. George C. Harlan and McCluney Radcliffe), Dr. Homer J. Rhode (the house-surgeon) and I immediately enucleated the globe-containing ball without rupture. We found the remains of both catgut and silk suture material in the scleral wound. The specimen was given

* Read before the Pan American Medical Congress, held in Guatemala, 1908.

to the pathologist of the hospital (Dr. Harold G. Goldberg), whose most careful report of the pathological findings is as follows:

"Smears were taken from the interior of the remaining portion of the eyeball and from the sheath of the optic nerve. They were stained with Loeffler's methylene blue and that of Gram. The stain from the globe showed polymorphonuclear leucocytes, numerous clear cells and fibrin. There were no bacteria. The stain from the nerve sheath showed leucocytes, blood, and one string of four small oval cocci that were positive to Gram's stain.

"The antero-posterior length of the globe was twenty-two millimeters. The horizontal diameter in the equatorial region equaled twenty-two and five-tenths millimeters. The vertical measurement in the same position was nineteen millimeters. The measurements of the optic nerve showed the greatest to be five millimeters in the transverse diameter. At the head of the nerve the diameter equalled three and five-tenths millimeters.

"Upon section through the horizontal equatorial meridian of the eyeball it was found that the globe contained a gold ball. The coats were much thickened. The lips of the wound were swollen, hard, and blood-stained. The optic nerve tissue was greatly swollen.

"Microscopically, the sclera was found to be much thickened. Its tissues were infiltrated with leucocytes, which in places were grouped into large masses. The outer third of the tissue composing the thickened sclera was composed of dense white fibrous material with but little elastic tissue. The middle third, which was about as broad as the outer third, was composed of connective tissue that was alveolar in type, quite cellular, and contained a considerable amount of elastic and connective material cells. This portion had new empty blood vessels and many round mononuclear cells in it. The inner third of the sclera, which was more densely fibrous, though cellular, than that which was seen in the other third, was only about one-fourth as broad as the middle and the outer thirds. This layer contained many new connective tissue cells and was filled with mononuclear leucocytes, which also lined the cavity of the globe. Large masses of small round cells independent of the blood vessels, were found throughout the tissues. The lips of the opening of the globe were quite vascular. The vessels were rigid with blood, and there were blood extravasations throughout this region. The tissue was very redundant, infiltrated with leucocytes, and so swollen that it fell back upon itself. The epithelium covering the surface was proliferated and

dipped into the tissues, forming papillomatous-like masses. In places, groups of these cells were enclosed within the scleral tissue, giving a glandular-like appearance.

"The nerve was much swollen and its fibers were atrophic. Its connective tissue elements had proliferated. It was thickly infiltrated with leucocytes, particularly anteriorly and externally near the sheath. The sheath itself was thickened and the lymph spaces were packed with mononuclear leucocytes. The central artery was plugged with leucocytes. The perineural vessel walls were thickened."

A series of photographs kindly made for me by Dr. Frank C. Parker, one of the assistant surgeons to the institution, showed the microscopic appearance of the remaining portion of the globe and optic nerve very well.

The left eye was subjected to a most careful and vigorous local and general treatment. Large doses of salicylates were used internally, and the local therapy, consisting of mydriatics, cycloplegics and miotics, with hot stupes, was changed as frequently as the conditions warranted, resulting in two weeks' time in an eye which was free from all active and gross signs and symptoms. The condition of the tissues was much bettered. The pupil, though small and irregularly dilated, was comparatively free in parts. Vision, which, on account of both capsular and lenticular opacities, was still reduced to light perception, became somewhat increased in area.

Three weeks after the enucleation, at the kind suggestion of Dr. Wallace W. McClure (one of my colleagues), I made a clean preliminary iridectomy without injury to the swollen and opaque lens in that portion of the iris which seemed to be in the best condition. The iris, as I have frequently observed in such cases, was friable and without resiliency. Thus given a chance to reach the underlying thickened capsule and contained cataractous lens, I removed the latter with a portion of the thickened capsular debris through a peripheral section made in the same position, two weeks later.

After three months' post-operative treatment, during which the eye again quieted, I drilled a hole through the remaining capsular material with a Tyrrell's needle. This was done without dragging upon the ciliary region.

No vitreous humor was lost during any of the procedures.

Two weeks after the final operation the patient's eyeground

could be distinctly seen through a central capsular opening, and corrected vision became qualitative.

Four years later, without any recurrence of inflammatory reaction, the remaining eye was in fair condition, and the patient enjoyed useful sight.

REMARKS.

Clinically the case is of value upon account of the character of the accident, the unhappy termination of the primarily performed operative procedure, and the final good result.

The specimen is of interest by reason of the great number and wide distribution of the mononuclear leucocytes and the absence of uveal structures.

THE ESTIMATION OF ERRORS OF REFRACTION BY MEANS OF ASTIGMATIC CHARTS.

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Since the introduction of cycloplegics into refractive work, considerable difference of opinion has existed among ophthalmologists as to the actual necessity of employing these drugs as a routine in the determination of ametropic conditions.

For practical use in a large out-patient clinic, in the very young illiterate, feeble-minded, or in cases of amblyopia or nystagmus, the best and only reliable method is, of course, retinoscopy under cycloplegia, where reliance has not to be placed on the statements of the patient.

While retinoscopy is thus of great value in certain cases, it is a well accepted maxim that if the patient does not accept our shadow test when brought out to the trial case, it would better be discarded. Even retinoscopy is not infallible, owing to difficulties introduced by peculiarities in the aberration of the eye. Too much reliance must not be placed on any one method of testing.

It would seem advisable to limit the use of cycloplegics as much as possible for two reasons. *First.* As the effect of atropine when used in sufficient strength to produce paralysis of accommodation lasts from four to fifteen days, during which time the patient is in a most uncomfortable condition, its use is clearly out of the question for active business men, and others who can not afford to lose time from their work. Homatropine, the effect of which practically disappears in forty-eight hours, while less objectionable, has still this same draw-back. *Second.* With the use of the fog-

ging method in connection with these astigmatic charts, cycloplegia in most cases is unnecessary.

It is time enough to place the patient under the influence of cycloplegics, if the fogging method should show any uncertainty in its results. But even though cycloplegics are used, one must wait until their effects have passed away before ordering the glasses. Examination then will show that only a certain amount of the total error obtained under cycloplegia can be corrected, provided the patient is hyperopic; and this amount will be found to correspond almost exactly with the results obtained by the use of the method herein described. If the patient is myopic, the glasses may be ordered without waiting for the effects of the cycloplegic to pass away, and in this case the results will be found to be almost identical with those obtained by the fogging method. In fact the results are better, when consistent, without than with the use of cycloplegics, on account of the eye being in its natural condition. We escape the increased aberration incident to a dilated pupil, and the relaxation of the lens due to paralysis of the ciliary muscle.

For an interesting and instructive tabulation of 126 examinations bearing on this point, the reader is referred to an article by Dr. C. N. Spratt¹ on the subject.

Quite naturally it has been difficult to find an accurate subjective method revealing the amount and axis of the astigmatism, the more so since the personal equation of each patient differs. Even in objective examination, the correction of the ametropic condition of the eye is not a simple optical problem, as has so often been stated.

In the method under discussion the addition of a convex lens placed in the trial frame before the eye, of a strength sufficient to blur external objects to the proper degree, forces the ciliary muscle out of commission for the time being, since no effort that it may make to overcome the blur will produce clear retinal images. A condition of affairs similar to the cycloplegic state is here produced, the difference being that in the one case the accommodation is paralyzed, while in the other the muscle is rendered ineffective for the reason above given.

The strength of the sphere thus used will vary in different cases, but a good plan to follow is to use enough plus sphere to blur distant vision perhaps two lines. Thus if the clearest vision possible should be 20/20 we could fog this until it was 20/40. More than this amount of fogging will not do in many cases, since

it produces so much blurring that contrasts in the distinctness of the lines is lost.

Having made the eye thus artificially myopic, the procedure after the cylindric correction has been found is the same as in any ordinary case of pure myopia, *i. e.*, by adding minus spheres until the most acute vision is obtained.

The fogging method by rendering all the refractive meridians myopic, places, as it were, all the lines on the astigmatic chart out of reach of the accommodation. In this way finer and more constant differences in apparent distinctness of the lines are made visible to the patient.

The method is of equal value in all forms of refractive error, and can often be used even in cases of young children, who not infrequently are more accurate in their replies than adults.

That the method is a simple, accurate subjective means of determining the amount and axis of astigmatism can not be denied. Almost always some astigmatism is discovered, and if not, one can be sure that little, if any, exists.

Dr. Frederick H. Verhoeff has designed two astigmatic charts,² Figs. I and II, which best answer the purpose. They may be obtained from E. B. Meyrowitz, New York.

The two charts "are identical in principle, but differ somewhat in detail, Chart No. I being designed to determine the axis, while the other is to be used for estimating more especially the amount of astigmatism."

Chart No. II consists simply of a disc pivoted through its center to a flat board, so that it may be rotated to the axis of astigmatism (blackest line) as obtained in Chart No. I.

Verhoeff says: "In labeling the lines, I prefer very large Arabic numerals placed opposite alternate lines as shown in the diagram. This renders it easy for the patient to read the numbers, even when they are very much blurred."

As supplied by Meyrowitz, however, the Arabic numerals are much too small, so that Verhoeff advises that the circle be cut out and pasted on a larger background; upon this figures are arranged as illustrated in Fig. I. Wilson's gummed figures measuring two inches in height pasted opposite alternate lines on this chart as shown in the accompanying cut, will be found very convenient.

It is likewise a good plan to place a large capital A and B at left and right corners, respectively, on the square to which the

(1) The Accurate Determination of Errors of Refraction without Cycloplegia by means of Astigmatic Charts. St. Paul Med. Journal, Aug., 1905.

disc has been pivoted. (Chart No. 11.) This renders it much easier for the examiner when the axis of the astigmatism happens to be oblique, to refer to the "line from A" or "the line from B," than to use hand motions designating the oblique line which runs from left, down, or from right, down. When the axis of astigmatism happens to be vertical, or nearly so, or horizontal, or nearly so, it is, of course, simple enough to refer to the lines as "the vertical" or "the horizontal."

The finer lines are placed on Chart No. 11 for the following reasons: "It is evident that if one of the wide lines appear more distinct, the fine lines at right angles to it will appear blurred, while at the same time the fine lines at right angles to the less distinct of the two wide lines will appear comparatively sharp. In this way the apparent difference in distinctness between the two wide lines is increased, since the sharp line is made to appear still sharper by contrast with its more or less uniformly blurred background, and the blurred line appears still more blurred because of the fine lines at right angles to it having become distinct. In effect it seems as if the blurred wide line was hidden behind the sharp fine lines.

"Another advantage of the fine lines is due to the fact that while they exaggerate the apparent difference in distinctness between the two wide lines, they also decrease the total amount of light reflected from the chart, thus rendering the latter less fatiguing to the eyes. The fine lines are an additional advantage in that astigmatism of low grade may be estimated by having the patient confine his attention to them, and ascertaining which pair of quadrants is the more distinct. In this way, too, after the amount of astigmatism has been determined by the aid of the wide lines, it may be confirmed by the fine lines."

Occasionally it will be found that when the fine lines are made equally distinct, the two wide lines become unequal. This, as explained by Verhoeff, is due to peculiarities in the aberration of the eye, and when it occurs attention should be given to the wide lines alone.

Another phenomenon also evidently due to some peculiarity in the aberration of the eye is exceptionally shown by Chart No. 1. It consists in the patient stating that two lines at a considerable distance from each other, sometimes even at right angles to each other, are equally distinct. The phenomenon occurs almost if not

¹See Verhoeff, J. H. B. C. C. C. C. New American Charts. Ophthalmic Record, 1907, 12, 299.

always in association with high visual acuity and may be taken as an indication that no regular astigmatism, or at least none that requires correction, exists.

We proceed to use the blurring method as follows: Determine the highest plus sphere, or lowest minus sphere, with which the best vision is still retained. Then cautiously add plus spheres beginning with the weakest, until vision is blurred sufficiently. This amount will vary with the individual case, but as explained above, a good plan to follow, except of course where lowered vision is due to some cause other than regular astigmatism, is to reduce vision about two lines.

Then transferring the patient's attention to Chart No. I it will be found that all the lines are blurred, but that one or more appear blacker and more distinct than the others. In some cases a certain amount of minus sphere, or its equivalent, may have to be added to improve the vision sufficiently for the patient to be able to recognize the difference in distinctness in the lines. Care should be taken that the patient keeps his eyes wide open, and does not endeavor to see better by narrowing his lids, as this would produce the effect of a stenopaic slit and lead to errors in determining both the axis and the amount of astigmatism.

When two lines appear equally black the axis, of course, lies between them. It is well to inquire also which of the lines is the next blackest, and to vary the axis accordingly. Head tilting must, of course, be avoided. In case the patient states that all the lines look alike, it is well to place a cylinder before the eye for a moment in order to produce artificial astigmatism, so that he may the more readily understand what we wish him to perceive.

Rotate the disc on Chart No. II until one of the heavy cross lines points to the figure indicated by the blackest line on Chart No. I. Make sure whether the blackest line is sufficiently blurred or not by trial with plus and minus lenses. Chart No. II may also be used now to confirm the axis as found by Chart No. I.

Add minus cylinders, beginning with the weakest, with the axis in the direction of the most blurred line until the two lines are equally black. Prove the result by adding -0.25 or -0.12 cylinder with the axis first in one direction, then in the other. In case a difference is found along one axis but not the other, the correction for the former is slightly too great.

Reduce with minus spheres until the clearest picture of the chart is obtained. The lines should remain equally distinct. If

not, an error has been made. The best spherical is then determined in the usual manner by means of the test type. A note is made of the lenses employed, and transposition made if necessary.

As a rule the higher the degree of refractive error, especially if hypermetropic, the more active the accommodation, and hence the greater the blurring required. If it is found that the blurring must be made excessive, this should be regarded as an indication for the use of a cycloplegic. The most common mistake made by the inexperienced in the use of the astigmatic charts is insufficient blurring.

Occasionally one of the lines—the horizontal, for instance—will be the darker, but when strongly blurred, the line at right angles to it, the vertical, is in turn blacker and more distinct. This shows that we have not yet fogged the second line sufficiently, and must keep on adding more plus glass.

In the higher grades of myopia, instead of adding plus spheres we add minus spheres, but not strong enough wholly to correct the error. In other words, we fog a myope by not quite correcting the distant vision. We then proceed in the usual manner by ascertaining the darkest line, adding minus cylinders with their axes in the direction of the most blurred line, until both lines are equally distinct, and finally secure the best vision possible with minus spheres. Here care must be taken not to use too strong minus spheres, but to get the best possible vision with the weakest possible glass.

Mixed astigmatism is as easily determined by this method as hyperopic or myopic astigmatism. It is hardly necessary to state that the method is equally valuable in cases in which a cycloplegic is necessary. The same procedure is followed, but less blurring is required. Often it is found helpful, before beginning the fogging method, roughly to ascertain the refraction by retinoscopy. This can be used as a partial guide and control to the subjective tests.

101 Newbury Street.

Reports of Societies

ELEVENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

In repeating the invitation to take part in the International Ophthalmological Congress of Naples, we add—for the ophthalmologists who are occupied in questions concerning blindness and the betterment of the condition of the blind—that from March 30th until April 3d the International Congress of Typhology will also be held in this city. The members of the Ophthalmological Congress will be invited to take part in the afternoon session to discuss together the following official subject, "Whether it be advisable in the treatment of patients afflicted with diseases immediately conducive to blindness, to give them correct information as to the precarious condition of their sight and such instruction as may be necessary to them when blindness overtakes them."

The sittings of the Ophthalmological Congress will take place in the buildings of the Royal University of Naples, by kind permission of the Rector.

The exhibition, in connection with the Congress, of objects appertaining to Ophthalmology, touching its practical as well as historical side, will be situated on the premises of the R. Clinica Oculistica in S. Andrea delle Dame.

In order to honor the memory of the founder of the Eye Hospital of Naples, on the occasion of the Congress, the presidency, from the remaining funds of the international subscription of 1905 intended to commemorate the lamented master, will assign six gold medals, each bearing the inscription of "Premio de Vincentiis," with the purpose of encouraging young students of ophthalmology, to the authors of the six most valuable as yet unpublished articles on the subject of ophthalmology.

The latest date for the presentation of the articles, which should be typewritten, has been postponed until October 31st.

The authors are further recommended to send the registration fee not later than January next, accompanied by a visiting card with the exact address, for the careful addressing of the membership tickets and of the request for the reduction in the rates for the sea and rail traveling in Italy.

Members wishing to secure rooms in advance should apply to the presidency of the committee, not later than February, 1909, that they may obtain, during the time of the Congress, apartments in the best hotels overlooking the sea in Naples and Posillipo.

Under the management of the committee, an excursion will be arranged to Capri by steamer, visits to the Grotta Azzurra and Sorrento; to Pompeii and its excavations; and to Pozzuoli, with visits to the antiquities and the Solfatara.

In conclusion the members of the Congress will receive all necessary information concerning visits and excursions to the city and suburbs, museums, Vesuvius, etc., for which the government and municipality will show the utmost liberality, and private societies will offer greatest facilities.

Kindly accept, eminent colleague, the assurance of our most distinguished consideration.

For the Managing Committee,
The President,

PROF. A. ANGELUCCI.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

An ordinary meeting of the Society was held in the rooms of the Medical Society on Friday, July 10. Mr. Marcus Gunn, F. R. C. S., president, in the chair.

Case of Pseudoglioma.

Mr. W. H. Jessop showed a "Case of Pseudoglioma, and a beautiful series of photographs of the fundus oculi," by Professor Dummer. Electricity was the illuminant. Mr. Bardsley showed several ingenious mechanical improvements in instruments. One was a new form of needle holder; another an adjustable modified trial frame, and a third an improvement in the "Moorfields" ophthalmoscope, introducing a double hole for indirect vision.

The Visual Fields in Pigmentary Degeneration of the Retina.

Mr. M. L. Hepburn read a paper, with lantern illustrations, on "The Visual Fields in Pigmentary Degeneration of the Retina." The contribution was based upon twenty-six cases, which were tested in various ways, owing to the risk of error, and the knowledge that much depended on the intelligence of the patient. His chief concern had been to estimate the amount of relatively functioning area remaining; in other words, how much of the retina had escaped destruction in such cases. Unless the rods and cones had been hopelessly damaged, the retention of visual acuity was a matter of degree. Where the patient showed uncertainty, the meter could be placed beyond doubt by stronger illumination. As it was desirable to have a definite standard to work to, he had

taken as his standard a ten-millimetre test object in natural light. He pointed out the relationship between the several varieties, and showed slides in illustration. The pathological changes in chronic inflammation of the choroid were of two kinds, and were represented by two kinds of visual fields. He raised the question whether the islands of vision occasionally seen through scotomata represented portions of retina which had escaped disease, or did they represent the reëstablishment of the circulation, or a new system of vessels.

Editorial

HOW SHOULD OPHTHALMOLOGY BE TAUGHT?

Nearly ten years ago an editorial appeared in this journal from which it may be opportune to quote at this present time. The title was, "The Education of the Ophthalmologist,"* and attention was drawn to the fact that at that time comparatively little had been done, said, or written toward guiding the medical student "to a due preparation for following any particular branch of medical education."

But before again considering this matter, a word must be said about a striking article which has just appeared written by Dr. Matthias L. Foster of New York City, entitled: "The Study of Refraction."**

As a product of sound common sense, knowledge of the subject, and humor, it is not too much to say it should be read by every oculist in this or any other land. Dr. Foster concludes thus:

"What I plead for is a more thorough study of the eyes of our patients and of the influences which bear on their refraction: for less positiveness and more observation and thought; and for an attempt to learn a more perfect method of fitting these intolerant eyes through a more perfect knowledge of their physiology."

Well, this is good advice. Which, however, of Dr. Foster's three pleas is the most important? Life is short. Probably the vote would favor the plea "for a more perfect knowledge of (ocular) physiology," and perhaps Dr. Foster would agree with the undersigned that after he and the undersigned had been cared for by the undertaker some one will have to undertake to take

* Ophthalmic Record, Oct., 1898.

** Annals of Ophthalmology, April, 1908.

our places and teach eye physiology. Dr. Foster writes modestly. The undersigned is not modest. He believes that when Dr. Foster and himself, —and perhaps Dr. Edw. Jackson—are gone, our places can not be filled by the Eye Bureau of the National Department of Health, which, it is hoped, will be presided over by Dr. G—— S. G ——, of the City of Brotherly Ophthalmologists, of Pennsylvania, as a member of the Cabinet.

So, Dr. Foster, don't you really think that to get back to the cervical region of the woods, the most important thing is to devise some way of teaching ocular physiology to students in such manner as shall enthuse and interest them?

Seriously, the revolutionary method of university life (mark you, not education, but *life*), introduced by President Woodrow Wilson at Princeton, seems to be worthy of the attention and imitation of those who can influence medical education. He goes back to the old method of Socrates, Plato and the other philosophical clinics of Greece, and has provided, at immense cost, for a small army of quasi tutors, after the manner of the English universities. These all but eat, walk and sleep with the comparatively few students apportioned to each. Character, rather than culture, is aimed at.

To make the application: Let the student read his textbooks in his room; but let all instruction be, so to speak, clinical, and his tutor one who has not only studied ocular physiology, but *applied* it in the laboratory and in the practice of ophthalmology. Let him be a man to whom the student can look up to first as a man; next as a friend, and lastly (but not least), as one who has added to the world's knowledge by research in ocular physiology, and by relieving and curing pain, the fear of blindness, and even blindness itself. When this not impossible consummation has arrived the world will say (*pace* shade of William Wordsworth):

This is the happy Teacher, this is He,

That every Man in the faculty should wish to be.

F. B. E.

Correspondence

OPHTHALMIC PEDAGOGY.

October 1, 1908.

Editor of THE OPHTHALMIC RECORD, Chicago, Ill.:

Dear Sir:—On page 167 of the September issue of the RECORD, I am made to say (in the discussion of the Symposium on Ophthalmic Pedagogy) that in the medical department of Temple University, "all ophthalmic work had been cut out for the general practice student."

May I ask you to correct this statement? The statement made by me was that "in the ophthalmic teaching of the medical department of Temple University (which teaching I direct), "the ophthalmoscopic work' had been entirely cut out." During the senior year, seventy hours of ophthalmic teaching are given, of which half are didactic and half clinical. During their clinical work students try to use the ophthalmoscope, and are assisted in this attempt, but they are urged to expend their energy on external ophthalmology, which is vastly the most important phase of ophthalmology for them, as prospective general practitioners.

Yours very truly,

WENDELL REBER.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. William Campbell Posey has returned from his trip to Europe.

Dr. A. Benedetti has qualified as instructor in ophthalmology in Naples.

Dr. Walter Thorner has qualified as instructor in ophthalmology in Berlin, Germany.

Dr. M. Uribe y Troncoso, of Mexico City, Mexico, has moved to 5a. Tucuba, 19 D. F., Mexico City.

The "Anales de Oftalmologia" has just completed its first decade, commemoration of which is shown in the July number.

Dr. William H. Wilder received a silver medal as runner-up in the Annual Physician's Golf Tournament held at Chicago.

Dr. W. Likely Simpson, of Memphis, Tenn., sailed October 3d for six months' study in the Eye and Ear Hospital of Vienna.

Dr. William Grey Miller was married recently to Alice Robinson Evans, in London, England. They will make their home in Newcastle, Pa.

Dr. Anthony J. Taugher and Dr. James A. Bach, of Milwaukee, Wis., have recently received appointments to the eye and ear staff of the Misericord Hospital, Milwaukee.

Dr. A. M. Earel, of Hoopston, Ill., who has spent the past six months in postgraduate eye, ear, nose and throat work in Chicago, has gone to Vienna to complete his studies.

Dr. W. S. Birkett, Montreal, has been appointed as a member of a committee to represent the medical profession of Canada at the Sixteenth International Medical Congress, to be held August 29 to September 4, 1909, in Budapest.

Dr. Brown Pusey has received the appointment of Professor of Ophthalmology at Northwestern University Medical School, Chicago, to fill the vacancy created by the resignation of Dr. Casey Wood. The only member of the former staff to be retained is the pathologist, Dr. Carlton.

Recent appointments in the medical department of Indiana University are: Professors of Ophthalmology, Dr. Albert E. Bulson, Jr., Fort Wayne; Dr. Frank A. Morrison and Dr. Thomas C. Hood, Indianapolis; Professors of Clinical Ophthalmology, Drs. Harvey C. Parker and Frederick Heath, both of Indianapolis.

Dr. M. Uribe y Troncoso has been appointed Chief of the Hygienical Service of the Federal District Schools in Mexico. He has begun the organization of the individual examinations of pupils according to the German methods. The whole system, including the eye, ear, etc., is examined by medical men, who refer the defective pupils to their own physicians.

The following officers were elected at the meeting in Cleveland, Ohio, August 27, 1908, of the American Academy of Ophthalmology and Oto-Laryngology: President, Dr. Otto J. Stein, Chicago; first vice-president, Dr. Percy Fridenberg, New York City; second vice-president, Dr. D. W. Greene, Dayton, Ohio; secretary, Dr. George F. Suker, Chicago; treasurer, Dr. S. H. Large, Cleveland; members of council, Dr. J. W. Murphy, Cincinnati, Ohio, and Dr. Casey A. Wood, Chicago.

A magnificent bequest to the Post-Graduate Medical School in New York has been announced in the will of the late Frederick Cooper Hewitt, of Owego, N. Y. Mr. Hewitt was a classmate at Yale of Dr. Dt. John Roosa, who gave twenty-six years of his active life to that institution. It is a matter of great regret to all that Dr. Roosa, who died only last spring, could not have lived long enough to see this splendid recognition of his work. Mr. Hewitt's bequest was an unconditional one, which marks him as a true philanthropist.

Dr. John Green, Jr., of St. Louis, Mo., addressed the Chicago Ophthalmological Society October 12th at an informal dinner which marked the beginning of this season's meetings. His subject was "Dependence of Ophthalmology upon other branches of Medicine." This very timely question was treated admirably by Dr. Green and his paper will prove undoubtedly to be a great stimulus to better and more thorough work. At the request of Dr. Green the paper was discussed by Drs. William H. Wilder, Casey A. Wood, Joseph Beck, Frank Brawley and William L. Balenger, the discussion being closed by Dr. Green. Dr. Thomas A. Woodruff, president of the society, presided at the dinner.

CHICAGO EYE CLINICS.

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THE OPHTHALMIC RECORD.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|--|---|---|---|---|--|
| 9 A.M. | Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) *Geo. F. Suker (P.G.) | J. Elliot Colburn (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Pattillo (P.G.) J. F. Burkholder (E. E. N. T.) | Richard S. Pattillo (P.G.) (G. W. Mahoney (Poli.) | |
| 10 A.M. | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | Oliver Tydings (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | Brown, Percy, N.W.C. Friday, 10 to 12 A.M. | | | | | |
| 1 P.M. | A. G. Wipern (E.E.N.T.) | A. G. Wipern (E.E.N.T.) | Willis O. Nance (C.C.S.) | A. G. Wipern (E.E.N.T.) | A. G. Wipern (E.E.N.T.) | A. G. Wipern (E.E.N.T.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. I. Gardner (E.E.N.T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) J. A. Phillips (Inf.) *Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) M. H. Lebensohn (P.S.S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) J. B. Loring (Inf.) *Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. Allen Barr (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) J. B. Loring (Inf.) *Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E.E.N.T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) J. B. Loring (Inf.) *Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | E. V. L. Brown (Inf.) W. Allen Barr (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) J. B. Loring (Inf.) *Wm. H. Wilder (Inf.) H. W. Woodruff (Inf.) N. A. Young (Inf.) J. B. Loring (P. & S.) E. K. Findlay (P. & S.) *Oscar Dodd (Inf.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) D. A. Payne (Inf.) F. A. Phillips (Inf.) Wm. H. Wilder (Inf.) M. H. Lebensohn (P.S.S.) S. L. McCreight (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P.S.S.) | H. H. Brown (Ills. Med.) | *J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.G.) |
| 4 P.M. | W. F. Coleman (P.G.) | C. W. Hawley (P.G.) | G. F. Suker (P.G.) | C. W. Hawley (P.G.) | W. F. Coleman (P.G.) Brown Pusey (County) | |

*Special operative eye clinics.

ABBREVIATIONS:

| | | | |
|---|---|---|--|
| C. C. S.: Chicago Clinical School, 819 W. Harrison Street. | County: Cook County Hospital, W. Harrison and Honor Streets. | Abbreviations: Poli.: Chicago Polyclinic and Hospital, 174 E. Chicago Avenue. P.G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. N. W. U.: Northwestern University, 2431 Dearborn Street. | Rush: Rush Medical College, W. Harrison and Wood Streets. St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
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THE OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS
OF OPHTHALMOLOGY

VOL. XVII CHICAGO, DECEMBER, 1908 No. 12, NEW SERIES

INCREASED TENSION IN OCULAR DISEASES OF INFANCY AND CHILDHOOD.*

JOHN EDWIN BROWN, M. D.,

COLUMBUS, OHIO.

(Illustrated.)

That there may be a disturbance of the relations between intra-ocular pressure and the resistance of the supporting tissues of the eye, in the young as well as adults, is a well established fact. But a deviation from the normal relationship of these two factors is ordinarily much more easily recognized in the adult than in patients in infancy, or even in childhood. In the adult, also owing to the more stable, mature character of the ocular coat, rendering it less elastic and less liable to undergo distension, this disturbed relationship more noticeably manifests itself in tension plus or tension minus, according to the nature of the deviation. On the other hand, in childhood, besides the greater difficulty in eliciting the tension, the problem is made more difficult by the fact that an increased intra-ocular pressure may actually exist, but may not be manifested by the usual $Tn +$, owing to the elasticity of the coats of the infantile or juvenile eye, and perhaps their gradual stretching and the consequent distension of the bulb in part or all of its diameters. Just as increased tension in the adult—glaucoma—proves disastrous to the integrity of vision, so similar disturbance in the young may eventuate in this same manner. These cases are not common and in their less marked manifestations are not easily or quickly recognized.

Their rarity should, however, be no excuse for failure to be on the alert for cases presenting such symptoms, as by early recognition we can no doubt be more successful in dealing with them.

Inflammatory glaucoma is a disease largely of adult life, yet the clientele of every ophthalmic surgeon has probably furnished a number of cases in which typical glaucoma occurred in patients between 10 and 20 years of age. In several such cases which I have seen no other disease than glaucoma could be diagnosticated, and fortunately most yielded to treatment without surgery.

My interest in this subject has been stimulated by cases,

*Read before the American Academy of Ophthalmology and Otolaryngology, Cleveland, September, 1908.

however, not so typical in their adherence to the usual glaucomatous symptoms, and I shall briefly report some of these:

Case 1. Baby D., aged 15 months, was brought to me by her parents, at the suggestion of the family physician, on account of continued trouble with her eyes which had been present for eight or nine months. The child had been under treatment most of this time. Nothing unusual had been noticed in the eyes or vision until the child was six or seven months of age, when mild congestion, tearing and photophobia developed. These symptoms seem to the parents to have increased in severity on the whole, though there were intervals in which they abated. The child seemed well nourished. Photophobia and blepharospasm were marked. On forcible exposure of the eyes, the corneal surface showed a slight milkiness or opalescence, though the epithelium was intact. The deeper corneal layer appeared to be clear. The anterior chamber was deep, the pupil slightly dilated and sluggish in response to light. There was mild circumcorneal injection and profuse lachrymation on exposure of the cornea to light. As could be best estimated tension was $+1$. Subsequent examinations confirmed the opinion that not only was the anterior chamber abnormally deep, but there was increase in the diameter of the cornea and of the entire bulb.

The treatment adopted was the use of 2% dionin and eserine, and weak atropin side by side. Forcible stretching of the orbicularis to overcome photophobia and blepharospasm. Sniffling and nasal obstruction were present, and without general anesthesia the post nasal space was cleared of a fair amount of adenoid tissue, and appropriate nasal treatment given in addition to the care for the eyes. Improvement was noticeable in less than two weeks, and in two months office treatment was discontinued. The photophobic and inflammatory symptoms subsided together. The haziness of corneal surface diminished and a number of months later was very slight. Whether the use of a mild yellow oxide ointment had anything to do with this I do not venture to say. There still remained, however, the impression of slight keratoglobus if not of hydrophthalmus. The child now, at the age of four years, impresses the parents as having very good eyes and vision, though being "slightly near-sighted."

Case 2. Baby R., 1 years of age, was brought to me on account of continued inflammatory trouble with his eyes. The disease began when about one year of age, and the symptoms enumerated were practically identical with those given in Case 1. The photo-

phobia was more severe and a careful examination of the eye was not so possible as in Case 1. There were to be noticed slight *maculae cornea*, deep anterior chamber and a slightly dilated and



Right Eye. Ectopia Lentis, Acute Inflammatory Glaucoma at 11 Years of Age. Paracentesis and, later, Lens Extraction for Cataract. No Distension of Globe.



Left Eye. At age of 14 Years, Subacute Glaucoma, with Luxation of Lens, Cataract, and beginning Hydrophthalmus. Extraction of Lens and Iridectomy.

sluggish pupil. The parents stated that the child had of late played very little with its toys, and then only in subdued light, and "seemed to be very near-sighted."

The child presented the symptoms of marked lymphoid (tonsil-adenoid) disease and the anesthesia required for operation was made the occasion of a careful examination of the eyes. Not only was the anterior chamber deep, but moderate hydrophthalmus was in positive evidence, much more advanced in one eye. Tension was plus.

Treatment similar to that in Case 1 was instituted and followed for several weeks, with diminution in the photophobia and blepharospasm, but no apparent improvement in vision. As little encouragement had been given the parents to anticipate restoration of sight from treatment, the case disappeared from view.

Case 3. Josephine K., aged 14, was one of a family of four children, two boys older, and one sister younger. Neither the parents nor brothers had ever suffered from any eye trouble. Up to the age when she entered the public schools no trouble had been experienced with her eyes. Later increasing difficulty in vision was noticed and the trouble was ascribed to "near-sightedness," and glasses were put on. The trouble increased and she was put under the care of an ophthalmic surgeon in another city and glaucoma diagnosed. On examination both eyes were found to be moderately hydrophthalmic with $Tn + 2$. Staphylomata were showing in the ciliary region. There was a central opacity of both corneæ; irides slightly atrophied and tremulous, lenses starchy. Vision was light perception, O. U. Four months after my first examination of this case I was called to see her and enucleated the left eye, which had been ruptured by a fall from stumbling in a hall-way. The remaining eye is becoming so distended that enucleation will probably be required later.

Case 4. Anna K., younger sister of Case 3, aged 11 years, was examined November 5, 1902. The same history was given of increasing failure of vision, beginning after school age, until it was feared that longer continuance would result in the same condition her sister had reached, the disease having been diagnosed as the same.

Examination showed: Right eye, globe normal in size, no signs of inflammation; the crystalline lens was dislocated supero-temporally and pushed the iris forward toward the cornea. The iris was tremulous save where in contact with the lens. Tension was diminished. Vision equals fingers at four feet (10/200).

Left eye, globe of normal size, no signs of inflammation; iris pushed forward by lens (transparent) so that pupil is at small

end of a rather flat cone; tension normal; refraction myopic. Reads ordinary type with ease.

December 10, 1902. I was called to see this patient and found her suffering from an attack of acute inflammatory glaucoma of the right eye. Tn $+2$, anterior chamber apparently abolished and lens completely cataractous. In twenty-four hours, there having been no yielding to treatment, I made a paracentesis. This relieved the glaucomatous symptom, though the anterior chamber was not completely restored. Two weeks later the cataractous lens was removed by linear extraction. There was some entanglement of iris in the corneal wound, due to the difficulty of working in the shallow anterior chamber. Since then the right eye has remained quiet with vision equal to 20/70 with correcting lens.

July 9, 1907, the patient came to see me concerning her left eye. I found it injected, tension $+1$, and the dislocated transparent lens lying in the lower angle of the anterior chamber, which was not nearly so shallow as when patient was first seen. The patient was put in the hospital and cold compresses and eserine ordered. I expected as soon as she was prepared for an anesthetic to attempt the extraction of the lens. On inspection at the hospital it was found that the lens had slipped back into the posterior chamber; the eye was free from pain and showed less congestion. Irritative and tension symptoms lessened, and as I was leaving the city for my vacation, the patient was allowed to go home and asked to report if signs of irritation returned. October 5, 1907, she returned. There were no signs of active inflammation and the tension was *normal*, but the lens had become cataractous, and marked stretching had taken place in the sclera of the ciliary region and of the limbus. The anterior chamber was deep, and the appearance of the ocular bulb suggested beginning hydrophthalmus. Under general anesthesia I extracted the lens, and performed a broad iridectomy, executing these in the order named. My reason for this was that I wanted as quietly as possible to get the lens out, for this was considered the main *desideratum* of the operation, and it was feared some complication, as loss of vitreous might occur during its performance. The lens was removed as easily as in any case of juvenile soft cataract. Iridectomy completed the operation. Four weeks later with $+5.00$ D. S. the vision of the eye was 20/100. The photographs from untouched negatives herewith show, perhaps imperfectly, but very satisfactorily, the different effects of the high tension on the two globes. In the right the scleral portion of normal size, the cornea slightly flattened if

changed at all, and the anterior chamber shallow. In the left the scleral portion of bulb is slightly distended, especially in the ciliary region, very slight keratoglobus, and a deep anterior chamber. The conditions in the right eye being due to a sudden, acute disturbed ocular pressure, those in the left to a sub-acute disturbance continued through a longer period of time.

These cases cited serve to call attention to tension—or rather the relationship of intra-ocular pressure to the resistance of the ocular coats. Increased pressure may result in damage to the nerve without much effect on the ocular coats, as in glaucoma of the adult; may effect considerable change in these coats, the function of the nerve suffering very little (one of the most marked cases of this kind being reported by Warlemont, in which the corneal diameter was increased to 17 mm., the eyeball enlarged in all directions, iris tremulous, and pupil excentric, vision remaining 20/30); or again, as is most commonly the cause where the disturbance is not arrested early in its course, both the coats giving way under the pressure and the nerve damaged until vision is reduced to p.l. or even total blindness. After a certain stage is reached the bulb may continue to enlarge even when tension becomes minus. The finality of a well developed case of hydrophthalmus is usually enucleation, inflammation of the cornea from exposure giving rise to this necessity. I have not seen pain of a glaucomatus nature in any of these cases where the bulb had become distended.

In going through the records of admission to the Ohio State School for the Blind for the past ten years, covering something over 500 pupils, there are 15 in which it was recorded that one, or both eyes, were hydrophthalmic. Data gained from history and examination indicates pretty clearly that ophthalmia neonatorum, with some corneal lesion, was the initial factor in at least six of these cases. In four ulcerative keratitis had been present and the evidence pointed to a severe inflammatory disease of the anterior segment of the eye as having preceded other changes. In the others there was less evidence to support a contention of other initial ocular disease. While cases of partial or complete blindness from the corneal lesions of trachoma and purulent ophthalmia are among these records, in which the various forms of staphyloma were present, in none of them was it found that the eye had become hydrophthalmic. Of six admissions from glaucoma in its ordinary phase, in only two was the patient under twenty when the disease developed, one 17 years of age, the other exact age unknown.

In the more moderate condition of hydrophthalmus tension

in the above cases was found plus, seldom over $+1$, in one case being recorded as $+2$ in one eye, wherein the fellow eye it was -2 . Despite minus tension these hydrophthalmic eyes continue to enlarge, the diminished tension usually indicated an increasing thinning of the cornea and sclera, together with exposure keratitis, conditions which seem incompatible with plus tension.

Johnson reported to the American Ophthalmological Society in 1898 three cases of Buphthalmia occurring in one family, the disease showing at an earlier age than the developments in cases 3 and 4 of my report. Priestly Smith reports an instance of hereditary glaucoma (*Ophthalmic Review*, XIII, page 215), both eyes of father and daughter having been affected, and gives the opinion that hereditary smallness of the eyeball, containing disproportionately large lenses, predisposes to glaucoma, and that such eyes are ordinarily attacked earlier in life by the disease than eyes of normal size.

Snellen, in writing on the treatment of Infantile Glaucoma leading to Buphthalmia, says there are two forms of glaucoma. Glaucoma anterior occurs with iritis, keratitis diffusa, descemetitis and very typically with hydrophthalmus. There must be congenital anomalies of the eye as intimated by Priestly Smith's theory as to hereditary glaucoma, changes at the filtration angles, congenital weakness of the ocular coats or some abnormality in their function in assisting in filtration of the intra-ocular fluids—to explain those cases where hydrophthalmus appears without manifest antecedent inflammation.

Knies' experiments, reported in Volume 24, *Archives of Ophthalmology* on "The Anterior Outflow Channels of the Eye," demonstrate an exit for fluids not only at the angle of the iris—Spaces of Fontana—but also by the posterior surface of the cornea—through the membrane of Descemet and corneal stroma, and thence to the subconjunctival tissues. Bowman in discussing the subject of conical cornea, which disease has its kinship to glaucoma and hydrophthalmus, calls attention to the fact that progress in this disease is checked by transudation of intra-ocular fluid by this route so that the balance between resistance of the cornea and intra-ocular pressure is re-established.

This array of facts should help us keep in mind that disturbance of intra-ocular pressure may be an element in a number of diseases of the eye in infancy and childhood, and may explain a less tractable course for some of these maladies. It may disappear as an element in the disease without having wrought any permanent

impairment to vision, but in others may do damage to this function, and yet in others give rise to secondary changes that will in time produce blindness. In such ocular inflammations the usual local treatment may have to be influenced by this element of increased tension, eserine and dionin being agents that, judiciously used, will greatly aid in resolution of the disease. The element of high tension may cause us to use cold as an application, where otherwise we would prescribe heat.

In incipient, but positive, beginning hydrophthalmus, iridectomy should prove useful. Snellen says iridectomy is unusually dangerous in these cases, this opinion applying no doubt with more force to advanced cases, and advises repeated sclerotomies with myotics. On the other hand, reports are on record of cases arrested by iridectomy: One by Bergmeister in a child of six months of age (*Wiener Klin. Wochenschrift*, No. 18); and Lodato, studying the subject, declares iridectomy the best means of preventing further development of the hydrophthalmus.

It is doubtful whether it is of any advantage when the disease is advanced, *i. e.*, the eye greatly enlarged, vision reduced to nearly light perception and tension has dropped to normal or is minus.

THE SPHENOIDAL SINUS AS A POSSIBLE ETIOLOGICAL FACTOR IN THE PRODUCTION OF RETRO-BULBAR NEURITIS FROM AN ANATOMICAL STANDPOINT—OBSERVATIONS ON SIXTY SPECIMENS.*

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Rhinology is even yet a comparatively new science. Accurate and complete symptomatology have of necessity been compelled to await the discovery and development of improved examination methods. Consequently, it has been only during the last score of years that systematic study and observation have been made of the relationship existing between diseases of the eye and affections of the nose and its appendages.

Among the first to call attention to this intimate connection

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were Zuckerandl¹, with his anatomical investigations, while Berger-Tyrman² took the problem up from its clinical aspect. Tiem also published many articles from 1885 to 1893. Grünwald³ in 1893 was probably the first to speak of the frequency of latent empyemeta of the sinus and their bearing upon ocular disease. During later years Onodi has contributed a wealth of valuable information and data in regard to the accessory nasal sinuses and their relation to neighboring structures. In addition to the above authors many Americans as well as other Europeans have contributed voluminously and interestingly.

A glance at the long list of case reports and other contributions bearing upon this subject which have appeared in the medical literature during the past half dozen years offers prima facie evidence of the importance ophthalmologists are paying to the rôle which disease of the accessory sinuses play in the production of optic nerve inflammations. It is as if a new impulse had been given to this particular factor.

In view of this, you may well be surprised to hear that a well known American text book appearing as late as 1904, makes no mention of sinusitis in considering the possible etiology of retro-bulbar neuritis. This volume is in quite general use by both students and practitioners and is more than a hand book in dimensions and scope.

It is not within the design of this paper to go into the clinical aspects of disease of the sphenoidal sinus in its relation to optic nerve inflammation. The literature abounds in reports of interesting cases in which drainage and proper treatment of sinus empyemata have been followed by most satisfactory and brilliant results upon the course of neuritis. We wish, rather, to place before you certain facts concerning the anatomical relations of the optic nerve and commissure to the sphenoidal sinus and orbit based upon results of observations made upon specimens, thereby demonstrating the intimate relationship existing between the two.

The specimens upon which the studies are made constitute the greater part of a series which were collected and prepared by Dr. Gibson, and by him measured, data correlated and reported in great detail before the section of Laryngology at the recent

1. Zuckerandl. Normale und pathologische Anatomie der Nasenhöhle und ihrer pneumatische Anhänge. 1893.

2. Berger-Tyrman. Die Krankheiten der Keilbein-Höhle und des Siebbein Labyrinthes und ihre Beziehungen zu Erkrankungen des Sehorganes. 1886.

3. Grünwald, Ludwig. Die Lehre von der Nasenseite rungen mit besonderer Büchsecht und de Erkrankungen des Lieb und Keilbein.

meeting of the American Medical Association in Chicago. In this report, which will soon appear in a forthcoming number of the *Journal*, Dr. Gibson demonstrated that the sphenoidal sinus was subject to great variation as to shape, size, extent, position, presence and absence of diverticula of various distribution. Our interest, however, is directed more especially towards points not investigated at that time, namely:

1. How much protection has the optic nerve and the commissure from the sphenoidal sinus.
2. Diverticula extending extending towards the orbit.
3. Observations concerning the blood supply.

In all sixty specimens have been examined. The majority were taken at random from the dissecting room of the University of Buffalo, while the remaining few were obtained from other available sources. In getting the material together no attention was paid to race, previous history or sex. In this series the male predominates. It may be mentioned in passing that there is no appreciable difference in sinus wall thickness between the two sexes. The skulls are those of adults of various ages, the general average being somewhere near 45 years. The specimens are "dry," that is to say, all soft tissues and membranes have been carefully removed and the bones thoroughly dried. Most of them have been prepared less than eighteen months, although a few of them are much older.

In most instances measurements were made by means of a carefully graduated steel rule. In some of the specimens the walls were so thin that it was absolutely impossible to saw them cross-section without destroying the wall itself. In such instances the wall thickness was estimated by its light transmitting qualities as compared to thin plates of bone of known thickness, care being taken that the source of illumination was equal in all cases. Every time there was any doubt, the measurement was *over* rather than *under* estimated. In this respect our data may be regarded as very conservative. On the whole it has seemed to us that the specimens may be regarded as presenting a fair average of actual normal conditions as existing in adult life.

Undoubtedly what concerns us most is the thickness of the sinus wall, where it comes in close relation to the optic nerve, as the latter winds around the side and roof of the cavity, and further back where it joins its fellow to form the commissure. In each instance, where the wall varied in thickness, as it nearly always does for obvious reasons, the *thinnest* portion was measured.

MEASUREMENTS OF THE SINUS WALL AT THE INTRA-CRANIAL PORTION OF THE OPTIC NERVE.

| | |
|--|--------------------|
| 20 specimens measured 0.25 mm. (1/100 in.) or less, i. e., | 33 $\frac{1}{3}$ % |
| 18 specimens measured 0.50 mm. (1/50 in.) or less, i. e., | 30% |
| 10 specimens measured 1.00 mm. (1/25 in.) or less, i. e., | 16 $\frac{2}{3}$ % |
| 2 specimens measured 2.00 mm. (1/12 in.) or less, i. e., | 3 $\frac{1}{3}$ % |
| 10 specimens measured from 2.5 mm. or less, i. e., | 16 $\frac{2}{3}$ % |
| 60 Total, | 100% |

Thickness of wall at optic commissure. In all of our specimens we found that invariably the sinus wall in the region of the optic commissure was a trifle thinner than at the point measured along the optic nerve canal, but scarcely ever thicker. The two measurements corresponded so accurately in each instance that it seemed useless to tabulate a separate set of figures for the commissure. The same measurements and percentages may be taken for both commissure and optic nerve wall.

Diverticula. In 85 specimens which were examined (all of the present series of 60 with 25 additional specimens in which it was impossible to complete sinus wall measurements) 15, or a trifle over 17 per cent. presented diverticula which approached or invaded the orbital wall.

In addition to this it must be remembered that often there is a cell in the orbital process of the palate bone which may communicate with the sphenoidal sinus. In this event this cell becomes practically a diverticulum of the sinus, being continuous with its cavity.

Other details of interest. In many specimens the optic nerve canal presented itself as a distinctly rounded ridge in the sinus wall, so that in some instances nearly one-third the nerve was so encompassed. This, of course, places the nerve in a much more exposed position as to the sinus than is usually found. Some specimens were found in the cases reported by Dr. Gibson, in which a large posterior ethmoidal cell completely over-rode the sphenoidal, so that the nerve was not brought at all in contact with the latter.

Blood supply. The arterial supply is usually credited as coming from the spheno-palatine artery which passes underneath, but *outside* of the sinus. Careful inspection of recent specimens fails to reveal arteries of demonstrable size in the lining membrane of the sinus. Therefore, it would seem fair to assume that the sinus depends for its arterial supply, in part at least, from the periosteum of adjacent cavities. The same assumption may hold good for the

4. Poirer and Cuneo. "The Lymphatics."

venous system. Nothing of definite nature is known of the lymphatics. (Poirier and Cuneo⁴.)

Is it not possible that on a smaller scale a circulatory condition obtains here similar to that existing between the dura and the scalp: two vascular membranes separated by a lamina of bone? Although in the case of the sphenoidal, for the heavy bones of the skull is substituted a thin, bony shell of paper-like thickness and one very likely extremely porous.

Conclusions. We believe that these measurements and observations are interesting if not significant. If the findings on these specimens are a reasonably fair indication of normal adult conditions and taken as they have been, at random, without regard to clinical history or cause of death, we believe they may be regarded as the normal index, it then follows that one-third of optic nerves and commissures are shielded from the sphenoidal sinus by a thin paper-like bony wall measuring a quarter of a millimeter ($1/100$ in.) or less in thickness. It is difficult to conceive how an inflammatory process could go on in a sinus of this type without causing functional impairment, if not serious damage to its neighboring optic nerve or chiasm. In instances where the optic nerve canal bulges into the sinus cavity in the manner described above, the nerve is more exposed than ever to possible morbid processes in the sinus. In nearly another third (30%) of individuals, this protecting wall, while double the thickness of the first third, measures one-half millimeter ($1/50$ inch) or less. With even this double barrier is it not likely that a lively suppurative process might readily invade a bony lamina of its thickness?

If our conclusions concerning the blood supply arrangement in the sinus are sound, one may readily comprehend the avenue by which infection might travel. Perhaps very much as the meninges are endangered by suppuration of the scalp, so the optic nerve may be endangered by infective processes in the sinus.

Further, it is to be remembered that, in the great majority of cases the ostium of the sphenoidal lies in the upper third of the anterior sinus wall, that is, a third nearer the roof than the floor.

It follows that natural drainage is impossible until fluid has reached the level of this opening, and the sinus is two-thirds full. This condition of affairs means that the walls of the sinus as well as the floor are brought in intimate contact with infected material.

You will remember that about 17% of the specimens presented diverticula approaching and even invading the orbital wall, and that also in the orbital process of the palate bone is sometimes

found a cell communicating with the sphenoidal, and as such may be regarded as a diverticulum. In many instances the wall separating this diverticulum from the orbit is extremely thin. Is it not possible that disease in a sinus of this type might be responsible for some of the obscure cases of orbital inflammations? From an anatomical standpoint it is certainly possible.

It would seem that the data furnished by the study of these specimens would emphasize anew the importance of serious consideration of possible sphenoidal disease, as well as affections of the other accessory nasal sinuses, in all retro-bulbar inflammations of the optic nerve, the origin of which is not definitely accounted for by other distinct causes.

482 DELAWARE AVE. _____

SOME FACTS CONCERNING FAMILY EXOPHORIA.*

BEING A PRELIMINARY CONTRIBUTION TO A STUDY OF THE RELATION
OF CRANIAL BUILD AND ORBITAL FORMATION TO THE
STATUS OF THE EXTRINSIC OCULAR MUSCLES.

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(Illustrated.)

The question as to what influence heredity may play in the production of esophoria, exophoria and hyperphoria has, so far as the writer's knowledge goes, not yet been investigated. With the continued increase of interest in all problems relating to the ocular muscles, it seems that the time has come when this phase of exophoria should be included among such studies.

That intrinsic exophoria (and also intrinsic hyperphoria) have a tendency to appear in more than one member of a family, is a sentiment that the writer has harbored for some years past. This sentiment was partly emphasized by a study of two and sometimes three generations of families in which it was claimed that headaches and neuralgia were hereditary. It was found in several instances that individual cranial peculiarities marked those particular members of such families who had had "the same kind of headache or neuralgia as their mothers or fathers," or uncle or aunts had had before them. They seemed to look upon it as an inheritance for which it was a waste of time to seek relief.

Now if there is one fact in ophthalmology more striking than any other, it is the persistent fashion in which Nature in some families hands down, from generation to generation a certain type of defective eye or eyes. One of the commonest examples is the way astigmatism will be passed on in degree and axis, from parent

*Read before the American Academy of Ophthalmology and Otolaryngology, Cleveland, September, 1908.

to child. When we remember that this means a reproduction in the child of the curvature of the parent's cornea, even to a fraction of a millimeter, we shall be duly impressed with the far-reaching results of the influence of heredity. If such can be the close adherence to the law of heredity in so delicate a matter as corneal curves, how much more likely is it to show forth in the balance or imbalance of the external ocular muscles. That such balance or imbalance is to a certain extent influenced by the cranial conformation and orbital build, is today practically an accepted fact. Risley, in 1895, contended that "it is highly probable that the defective form of the eyeball which produces the ametropia, and the faulty attachment of the muscles of the globe which causes the ocular imbalance, are the direct result of the defects in the shape of the bony orbit and this in turn is due to distortion of the skull. It follows, therefore, that the possibility of hereditary anatomical malformation should be excluded in every case before accepting the theory of hereditary headache." Two years later Stevens brought forward his hypothesis, *Archives of Ophthalmology*, Knapp, 1897, "that according as individuals are long skulled (dolicocephalic), mediund skulled (mesocephalic), or broad skulled (brachycephalic) there will be certain corresponding position of the visual axes."

About two years ago it occurred to the writer that the diagrams used by hatters might be profitably used in such a study as the foregoing, and he began sending members of families in whom there were two or more exophorias, to the hatter for a "conform," as it is called by those in the hat trade. These diagrams represent fairly well the anteroposterior and the interparietal (transverse) diameters of the skull just a trifle less in both diameters than they actually are, because the hatter wants a diagram of the head where the inside rim of the hat is to rest, just barely above the longest and broadest diameters of the head of the wearer. So that the relative proportion between the anteroposterior and interparietal diameters, as represented by these hatter's diagrams (or conforms) is very close to the actual anatomic relations. Moreover, they represent the transverse plans of the cranium at approximately its broadest point, in much more graphic fashion than it can be mapped out from measurements with a craniometrist's calipers.

In the female members of these exorphoric families, the use of the "conformateur" (as the device is called by which the conforms are secured) is not feasible, because of the fact that unless the hair is taken down and allowed to fall loose while the measurement is being made, there would be introduced too many complications, such as combs, uneven masses of hair, etc. In these cases,

therefore, an ordinary large mechanic's calipers were used and the two diameters registered.

Craniologists classify skulls accordingly as they are dolicocephalic (long heads), mesocephalic (medium heads), and brachycephalic (broad heads). The cephalic index is obtained by multiplying the transverse diameter by 100 and dividing by the anteroposterior diameter. For instance, if the anteroposterior diameter, as in one of my patients, is $7\frac{3}{8}$ inches and the transverse diameter $5\frac{3}{8}$ inch, the cephalic index is 72.88. In the diagram shown in Fig. 1 the cephalic index is 70.

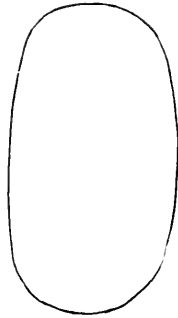


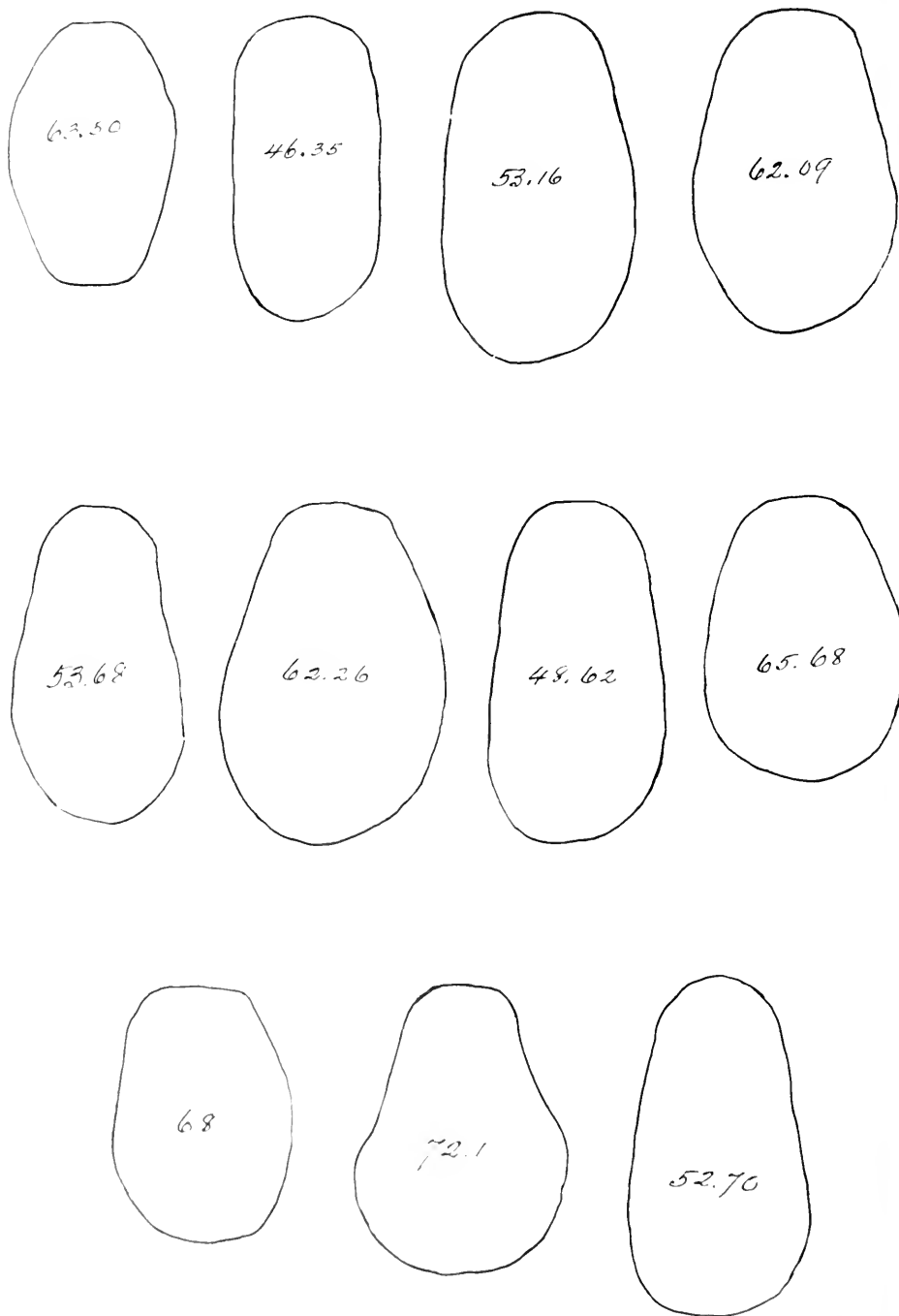
Fig 1.

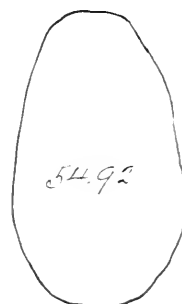
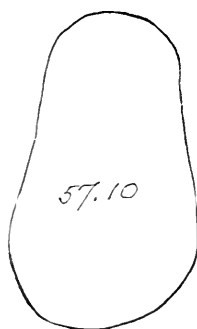
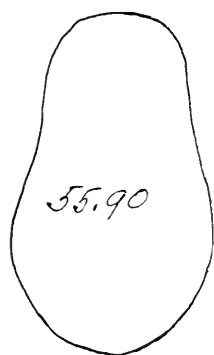
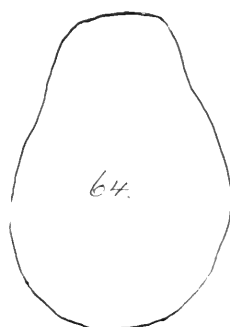
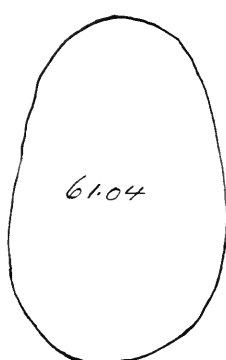
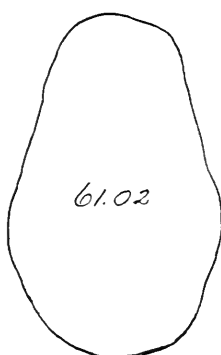
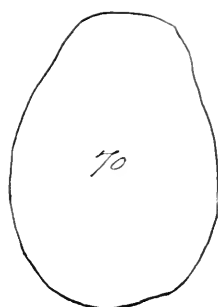
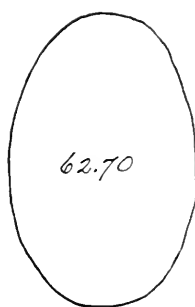
Topinard arranges skulls with a cephalic index less than 77.77 as long ones, those with an index from 77.78 to 83.34 as medium heads, and all above 83.34 as broad heads. On this basis the great majority of the heads measured in this study fall in the long skulled class.

As a control factor, 20 conforms were secured from a hatter, which represents the heads of 20 men who had been consecutively measured as they came into the hatter's store. In other words, they represent 20 heads measured without any idea as to what form of skull or what state of muscle imbalance they represented. These diagrams are shown in Plate No. 1, and with them may be contrasted those shown in plate No. 2.

From my recent records I find several families that show a greater or less exophoric tendency. Doubtless there are many others in my records did time offer to investigate the side lines. Indeed, many exophorias belong to exophoric families. only the muscle status does not interest the ophthalmic surgeon sufficiently to impel him to carry his investigations that far. In none of the families inquired into were more than two generations involved.

In Family No. 1 there were seven members, one of whom was esophoric and six exophoric. The four exophoric members whose

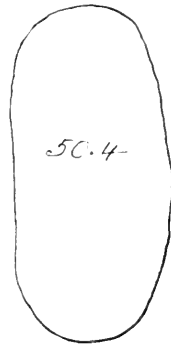
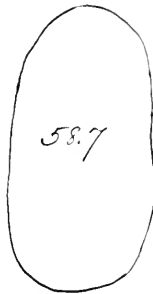




heads were measured were all shown to have long (dolicocephalic) heads. Their cephalic indices were 66, 62, 73 and 66. Table No. 1.

In *Family No. 2* there were five members, of whom one was orthophoric with a cephalic index of 79. The other four were all exophoric and all showed dolicocephalic (long) heads, their cephalic indices being 68, 65, 70 and 77. Table No. 1.

| Name. | Age. | Refraction. | Esophor. | Exophor. | Exo. at 13 inches. | Convergence near point in inches. | Prism Divergence. | Right Hyperphor. | Left Hyperphor. | Anaphoria. | Character at Head. | Cephalic Index Conf. | Cephalic Index Calip. |
|--------------------|------|-----------------|----------|----------|--------------------|-----------------------------------|-------------------|------------------|-----------------|------------|--------------------|----------------------|-----------------------|
| FAMILY No. 1. | | | | | | | | | | | | | |
| L. H. | 25 | H and A H. | .. | 15 | 25 | .. | .. | .. | .. | .. | .. | .. | .. |
| W. A. H. | 30 | H and A H. | .. | 2 | 10 | .. | 4 | 10 | .. | .. | L | 66 | .. |
| Mrs. L. H. | 60 | H and A H. | .. | 2 | .. | .. | .. | .. | .. | .. | L | 62 | .. |
| Jno. H. | 40 | H and A H. | .. | 11½ | 1 | .. | .. | .. | .. | .. | L | 62 | .. |
| Miss H. | 40 | H and A H. | .. | 6 | 2 | .. | .. | .. | .. | .. | L | 75 | .. |
| C. H. | 18 | H and A H. | .. | 7 | 12 | 3 | 10 | .. | .. | .. | L | 66 | .. |
| J. J. H. | 55 | H and A H. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| FAMILY No. 2. | | | | | | | | | | | | | |
| E. J. | 9 | H and A H. | .. | 2 | 6 | 2½ | .. | .. | .. | .. | L | 68 | .. |
| C. E. J. | 37 | H and A H. | .. | 8 | 13 | 2 | .. | .. | .. | .. | L | 50 | .. |
| L. J. | 11 | H and A H. | .. | 15 | 12 | 3½ | .. | .. | .. | .. | L | 60 | 68 |
| E. J. | 16 | H and A H. | 9 | 0 | 0 | 2 | .. | .. | .. | .. | M | .. | 78 |
| Mrs. J. | 36 | H and A H. | .. | 8 | 13 | 5 | .. | .. | .. | .. | L | .. | 77 |
| FAMILY No. 3. | | | | | | | | | | | | | |
| Mrs. K. | 57 | A M. | .. | 14 | 18 | 5 | 10 | .. | 4 | .. | L | .. | 77 |
| Miss G. K. | 25 | A H. M. | .. | 3 | 3 | 3 | .. | .. | .. | .. | L | .. | 71 |
| G. K. | 35 | H and A H. | .. | 2 | 10 | 2 | .. | .. | .. | .. | L | 60 | .. |
| H. F. K. | 30 | H and A H. | .. | 1 | 12 | 3½ | .. | .. | .. | .. | L | 50 | 75 |
| H. F. K., Sr. | 60 | H and A H. | .. | 2 | 15 | 2 | .. | .. | .. | .. | M | 69 | 82 |
| Miss K. | 25 | H and A H. | .. | 1 | 0 | 2 | .. | .. | .. | .. | M | .. | 82 |
| Miss K. | 23 | H and A H. | 1 | .. | 0 | 2 | .. | .. | .. | .. | M | .. | 80 |
| H. H. K. | 26 | A H. | .. | 3 | 5 | 2 | .. | .. | .. | .. | .. | .. | .. |
| Miss O. H. | 20 | A H. | .. | 5 | 10 | 3 | .. | .. | .. | .. | .. | .. | .. |
| Miss K. | 22 | A H. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| FAMILY No. 4. | | | | | | | | | | | | | |
| Mrs. L. | 47 | H and A H. | .. | 1 | 6 | 3 | 8 | .. | .. | .. | .. | .. | .. |
| S. L. | 25 | H and A H. | .. | 10 | 14 | 4½ | 10 | .. | .. | .. | .. | .. | .. |
| E. L. | 22 | H and A H. | .. | 2 | 10 | 4 | 5 | .. | .. | .. | .. | .. | .. |
| J. L. | 19 | A H. M. | .. | 5 | 15 | 5 | 8 | .. | .. | .. | .. | .. | .. |
| FAMILY No. 5. | | | | | | | | | | | | | |
| Mrs. M. | 50 | H. | .. | 4 | 6 | 2½ | 8 | .. | .. | .. | L | .. | 73 |
| Miss M. | 25 | H and A H. | .. | 10 | 14 | 5 | 10 | .. | .. | .. | L | .. | 73 |
| Mrs. E. | 47 | H and A H. | .. | 10 | 15 | .. | .. | .. | .. | .. | .. | .. | .. |
| Mrs. J. | 39 | H and A H. | .. | 6 | 8 | 4 | .. | .. | .. | .. | .. | .. | .. |
| Jno. M. | 51 | H and A H. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| FAMILY No. 6. | | | | | | | | | | | | | |
| L. N. | 32 | H and A H. | .. | 12 | 20 | 5 | .. | .. | .. | .. | .. | .. | .. |
| S. N. | 34 | A H. M. | .. | 2 | 8 | 3 | .. | .. | 1½ | .. | L | 71 | .. |
| H. N. | 14 | A H. M. | .. | 2 | 4 | 3 | .. | .. | .. | .. | .. | .. | .. |
| H. N. | 19 | M and A M. | .. | 1 | 3 | 3 | 8 | .. | .. | .. | .. | .. | .. |
| L. N. | 25 | A M. | .. | 2 | 5 | 3 | .. | 1 | .. | .. | .. | .. | .. |
| H. N. | 60 | H and A H. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| FAMILY No. 7. | | | | | | | | | | | | | |
| G. M. | 23 | H and A H. | .. | 12 | 18 | 3 | 14 | .. | .. | .. | L | 66 | 80 |
| L. M. | 17 | H and A H. | .. | 1 | 10 | 4 | 10 | .. | .. | .. | L | 62 | 78 |
| H. M. | 25 | H and A H. | .. | 2 | 5 | 5 | 10 | .. | .. | .. | L | 60 | 77 |



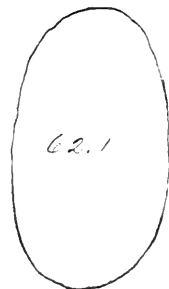
FATHER AND TWO SONS.



FATHER AND TWO SONS.



THREE BROTHERS.



UNCLE, FATHER AND SON.

In Family No. 3 there were fifteen members, counting cousins. Of this number ten were examined. Two were found to be esophoric (with cephalic indices of 76 and 79), eight were shown to be exophoric and of this eight, four were long skulled, two were medium skulled and two were not measured. Table No. 1.

In Family No. 4 there were four members, all of whom were exophoric, one only of whom submitted to head measurement. This case showed a cephalic index of 68 and falls in the class of long heads. Table No. 1.

In Family No. 5, comprising ten members, but five were examined. One of these was esophoric and the remaining four exophoric. Of these four, the two that submitted to head measurements were typically long skulled. Table No. 1.

In Family No. 6, numbering nine members, six were examined. Of these six, one was esophoric (the mother) and all of the five children were exophoric in greater or less degree. Only one of these presented for head measurement and was typically long skulled. Cephalic index, 71. Table No. 1.

In Family No. 7, embracing six members, but three (all brothers) were examined. All of these showed both exophoria and dolicocephalus (long skull) their indices being 60, 62 and 60. Table No. 1.

To sum up, seven families, comprising fifty-six members, were investigated, and of these forty were personally examined by the writer. One was orthophoric, five were esophoric and thirty-four of the forty were exophoric.

Of the thirty-four exophorics, twenty-one submitted to head measurements, and of this latter number eighteen were long skulled and three were medium skulled (or mesocephalic). *If this proportion were to anywhere near hold out in a large number of cases it would rather indicate that dolicocephalus (or long skulledness) predisposes to exophoria.*

*Whether brachycephalus (broad skull) and mesocephalus (medium skull) have their associated state of muscle balance is not known. This is as far as the writer, at the present writing, is willing to go in endeavoring to form any conclusion issuing from the study just submitted.**

There are two other facts that stand out prominently in this study. The first is that out of the thirty-four exophorics examined, twenty-seven (80%) showed H + Ah, or its allied refra-

*The writer is now engaged in following out a large number of such cases, in order that more definite facts may be brought forward for consideration.

tive conditions: three (9%) showed M & Am and its allied refractive conditions, and four (11%) showed mixed astigmatism. These figures fall fairly close to those the writer presented to the Section of Ophthalmology at the Boston meeting of the American Medical Association in an analysis of 441 cases of exophoria. In that study 73% of the whole number of exophorias presented H — Ah, or its allied refractive conditions. The idea, therefore (largely continental), that exophoria is mainly innervational and usually associated with myopia and its allied refractive conditions, will have to be laid aside. The one the writer believes to be much nearer the truth is, *that all states of muscular imbalance are the result of two factors: (a) the anatomic build of the orbit, and (b) the innervational state of the muscles.*

That the innervation varies in different individuals—and even in the same individual at various times—goes almost without saying. The anatomic feature is one that has not been worked out as it deserves. Emmert (1c) and Danziger have both made notable contributions to this phase of the subject. Weiss (Knapp's Archives, Vol. XXXV) has summed the matter up by his statement that “the effectiveness of a muscle depends in general upon (1) its size, (2) its quality and (3) its insertion. In the case of the extrinsic ocular muscles, other factors than these three have to be considered, the main one being the direction of the muscle cone. This in turn is dependent upon the degree of divergence of the orbits, its depth, and the shape of the eyeball.” To this the writer would add the conformation of the skull as influencing the build of the orbit. “All these factors determine the size of the *Contact Arc* of the ocular muscles. The significance which the size of this contact arc has in determining the amount of movement imparted to the eye is well known.”

It was in the belief that peculiarity of cranial build might have much to do with orbital dimensions and hence with the direction of the visual axes, that this study was undertaken; and the writer has a feeling that further exploration of the subject will crystallize this feeling into a conviction. No one realizes more than he how tentative are the facts hereinabove submitted, and that they are a mere scratch on the surface of the immense study that lies just beyond. He hopes within a year to bring forth a larger array of facts touching, not only family cranial peculiarities, but also the relation of cranial and orbital formation to the muscle status in general.

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INNOVATIONS IN THE OPERATIVE TREATMENT OF PERSISTENT GLAUCOMA: A STUDY OF THE SUBSTITUTES FOR IRIDECTOMY.*

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The management of the various forms of pathologically increased intra-ocular tension is one of the vital questions of modern ophthalmology, and in spite of the vast amount of pathological research, clinical observation, and operative advance, it still remains an open one. We note first, the existence of certain forms, hemorrhagic glaucoma and simple chronic glaucoma, as to which there is a general consensus of opinion as to serious course, grave prognosis, both as to vision and the integrity of the eye, their intractability to treatment in general, and the frequent bad results of the iridectomy. This characteristic reaction or lack of reaction to the surgical procedures which are so efficacious in ordinary glaucoma has resulted in a clinical and diagnostic differentiation.

There seems to be a marked analogy to forms of optic nerve atrophy with progressive slow course and, generally painless, hypertension, indicated by a gradual contraction of the field, especially the nasal half, steady loss of vision, the development of a deep atrophic excavation, and entire freedom from pain, ocular injection and other signs of inflammatory reaction.¹ The differentiation of non-inflammatory simple glaucoma from that associated with irritation and inflammation is not always clear from the clinical standpoint. Inflammatory symptoms may develop in "simple" cases of many years' standing without ascertainable cause (Hirschberg and Ginsberg, *Centralbl. für Prakt. Augenh.*, XXXI, p. 1).

Another group is represented by those cases of inflammatory glaucoma which are not at all, or only temporarily, relieved by iridectomy, or, again, show a marked tendency to relapse in spite of operation.

The subject of treatment is a wide one, and of late years the debate on the comparative value of medicinal, meiotic treatment and of surgical intervention has been taken up with renewed activity. A decision has not yet been reached, and the consideration of this aspect of the question lies outside the limits of our presentation, which has as its main object a comparative study of the various surgical procedures which have in the course

*Read before the American Academy of Ophthalmology and Otolaryngology, Cleveland, September, 1908.

of time been introduced to assist or to take the place of the classical glaucoma iridectomy of v. Graefe.

While iridectomy is still considered the sovereign remedy for the large majority of all cases of glaucoma, is indispensable in acute forms, valuable in chronic forms, and even in glaucoma simplex is at least as favorable as any other procedure, in the judgment of many experienced observers, a number of operations have been suggested in the last decade or two, having as their object either to render the effects of iridectomy more permanent, to facilitate the technical success of the operation, or to replace it entirely.

We may accordingly distinguish two main forms: Iridectomy substitutes and modified operations. A third series of procedures was designed to be applied after iridectomy had failed, and persistence of pain and high tension, with or without inflammatory reaction, in a sightless or rapidly failing eye, required relief at any cost.

Among these procedures we may cite posterior sclerotomy, optico-ciliary neurectomy, and extirpation of the ciliary ganglion. Extirpation of ciliary ganglion (Rohmer, Abadie, Terrien) requires osteoplastic resection of the orbital wall after Kroenlein, and is a rather blind procedure, as it is not always possible to find the ganglion or to be sure that it is contained in the tissue removed from the depth of the orbit. It is permissible, at best, only in case of absolute glaucoma with persistent pain, where for some reason enucleation is inadvisable or has been refused by the patient. The only advantage over optico-ciliary neurectomy is the preservation of the globe, as atrophy does not follow, and the remnant of integrity of the optic nerve is preserved. Pain is relieved at once, but tension is not always reduced to normal. Among other measures we may mention trephining the sclera, and, as a last resort, enucleation. As these operations are intended more for the relief of intractable symptoms than for the actual cure of the glaucomatous process, and as our subject is rather a consideration of the supposedly or actually curative and effective substitutes and modifications of the classical operation for glaucoma, we may pass over them to a consideration of the latter class.

Modifications of Iridectomy. These were suggested by the dangers of the operation under certain conditions of extreme tension, shallow chamber, wide pupil, or hemorrhagic tendency, either general or intra-ocular. The most valuable is the preliminary sclerotomy, first recommended and employed as a routine by Priestly

Smith, and taken up again of late by A. Knapp and others. Among other procedures and peripheral iridotomy or button-hole operation, iridodialysis, and others since abandoned.

Substitutes for Iridectomy. In this class we may distinguish between minor or temporary procedures intended to reduce tension due to a transient cause or at least not due to primary glaucoma. Thus, in the high tension due to swelling of the lens in a stage of imbibition in senile or more frequently in traumatic cataract due to rupture of the capsule, in some forms of iritis, where the mutilating effect of iridectomy was to be avoided if possible, and the possibility of treatment with atropine continued; the object being to let out a certain amount of aqueous humor through an incision which should be so small as to preclude danger of iris prolapse. Anterior sclerotomy or paracentesis of the anterior chamber by section at the limbus was recommended, and this form of operation was even extended to glaucomatous hypertension by a modification intended to open up the tissues at the filtration angle (incision of the iris angle). These and similar suggestions have been followed for some time and are not strictly innovations in operative treatment.

The more modern substitutes with which we are directly concerned owe their origin to two theories of the curative mechanism in iridectomy and in other operations for glaucoma. Of these, the most important and well based hypothesis considers the opening up of a large area of iris tissue for filtration, and the freeing of an occluded iris angle as the main factors. It was believed that other portions of the uveal tract could be made available for this purpose and filtration paths established into the supra-choroidal space without sacrificing or injuring the iris, a manifest advantage in many cases, but most important in vascular disease or hemorrhagic tendency where copious bleeding would be apt to diminish or nullify the good effects of iridectomy.

Value of Sclerotomy. It is the operation of choice, according to Czermak, in simple glaucoma with good central and peripheral vision, and slight increase of tension, if any, where iridectomy would be contra-indicated on account of the optical disturbance it causes; in chronic glaucoma with plus tension and without attacks of pain, with rapidly diminishing visual field, which run a notoriously rapid unfavorable course after iridectomy, and in cases of atrophy of the iris, where the latter operation can not be performed, *lego artis*; in recurrence of glaucoma after iridectomy, or its development in consequence of dislocation of

the lens or of serous iridocyclitis with deep anterior chamber, and, finally, and undoubtedly, in glaucoma with iridocyclitis.

Modifications of the Sclerotomy Operation. Incision of the Iris Angle. De Wecker. Scleral flap section with a narrow Graefe knife, about 1 mm. from the limbus, as if to produce a scleral flap 2 mm. high. The section is to be made very slowly, and not completed, that is to say, after counterpuncture the sclera is not cut through but a central bridge about 3 to 4 mm. wide is allowed to remain. As the knife is withdrawn the handle is depressed (in section upward) so as to cut through the tissues at the filtration angle with the retreating point, leaving the layers of the sclera partially divided throughout the extent of the bridge. In case of a shallow anterior chamber the knife may have to describe a slight curve to avoid the iris. If the chamber is deep, the incision may be made a little lower down. Eserin should be instilled before and after operation, as it facilitates the procedure and assists in keeping open the wound made at the filtration angle. The bridge of scleral tissue was intended to prevent iris prolapse and to allow a more gradual escape of aqueous. If there is irregularity of the pupil, showing that the iris is adherent to the posterior lip of the wound or folded on its base, the iris-repositor or spatula must be introduced. If this is not effectual, iridectomy should be performed. This is to be advised unhesitatingly in case of actual prolapse of the iris, either during operation or at a later stage.

Wound Healing. The entire section should be about 5 mm. long. A filtration scar is a frequent sequela of this operation: in fact, De Wecker considered it the rule, and ascribed the good results of the procedure to this fact. There are undoubtedly, however, cases with normal healing in which the operation was perfectly successful and efficacious (Czermak).

Operative Procedures Based on Intra-Ocular Filtration. In these procedures the attempt was made with the underlying idea being to open up communication between the anterior chamber and some part of the uveal drainage tract, either filtration angle, ligamentum pectinatum, root of iris, or supra-choroidal space. The principal exponents of this idea were Nicati, De Wecker, Tersono, Knies, Panas and De Vincentiis, and the best known operations are incision of the iris angle, iridodialysis or arrachement de l'iris, sclero-choriotomy and cyclodialysis.

Operative Irido-Dialysis—Sclero-Iritomy. Nicati (1892) applied this name to a procedure which he devised for the purpose

of detaching the iris from its "attachment" to the sclera by means of a keratome incision through the latter membrane. The section was made with a lance knife having a shoulder or stop, and this was carried, under a conjunctival fold, tangentially to the cornea and perpendicularly to the plane of the iris. This procedure was originally recommended for glaucoma secondary to incarceration of the iris, and primary senile glaucoma, but later on Nicati admitted that it gave but indifferent results in ordinary glaucoma.

Irido-Sclerotomy. Knives. In this operation the sclero-corneal incision passes through the root of the iris, detaching it and causing an operative irido-dialysis, but the iris is not cut out. The section is best made upwards with a Graefe knife. The section must be made well back of the limbus and be completed very deliberately.

Irido-Sclerotomy. Panas. This operation was intended for cases with a very shallow anterior chamber, the knife being intentionally carried directly through the tissue of the iris, both at puncture and counter-puncture, thus actually performing iridotomy. In completing the section the blade of the knife is turned forward and the bridge of iris tissue completely severed. As in De Weeker's sclerotomy, the section is not carried through the entire thickness of the sclera, but a bridge remains, and two scleral wounds are produced which are each 2 to 3 mm. long. The section is made with a Graefe knife at a point about half way between the horizontal meridian of the cornea and tangent to the lowest or highest point of its periphery. As soon as the point of the knife appears in the anterior chamber it is plunged through the iris, carried about 8 or 10 mm. further on, pierces the iris again, appearing in the anterior chamber and then emerging at the counter-puncture.*

Indications. In high tension with shallow anterior chamber, due to accumulation of fluid behind the iris, as in pupillary seclusion, annular anterior synechiae, large staphyloma and as a preliminary to iridectomy.

Nicati (1891) devised a new operation, similar to that of Knives and Panas. A narrow Graefe knife is carried, cutting edge downward, through the sclera at the lower limbus, as in De Weeker's sclerotomy. After counter-puncture, the edge of the knife is turned directly backward until the blade is at right angles

*There is here, that this operation of Panas' is identical with his *irido-sclerotomy*, a variation which has actually been performed unintentionally by many operators and which they were making an iridectomy.

with the plane of the iris. The latter is then severed at its attachment throughout the entire extent of the section.

In this operation the iris is severed by backward section from the anterior chamber, the knife cutting through its tissues but once, whereas in the Knies-Panas procedure the same thing is accomplished in cutting out from the posterior chamber after the iris has already been pierced in making the puncture and counter-puncture. Treacher Collins has shown that this double perforation of the iris actually takes place in almost all sclerotomies with a peripheral section and adhesion of the ciliary margin of the iris to the cornea, so that the sclerotomy is actually an irido-sclerotomy. De Wecker and others have raised the very valid objection to the Panas-Knies procedure, that there is great danger of injuring the lens, as the posterior chamber is not deepened in glaucoma, and the lens lies close to the posterior surface of the iris.

Combined Sclerotomy. De Wecker (1894). Section 6 mm. long placed 1 mm. back of the limbus with a stop keratome. A fine pair of iris forceps is introduced into the anterior chamber, after the aqueous has been allowed to drain off slowly to avoid iris prolapse. The periphery of the iris is grasped and pushed along the posterior surface of the cornea toward the center of the pupil until the adherent ciliary margin has been detached for a distance of 6 to 8 mm. This is generally indicated by copious hemorrhage which may entirely fill the anterior chamber. Contrary to the usual custom the iris forceps must of course be open when it is withdrawn from the anterior chamber. If this point is forgotten, the iris may be dragged out of the wound. This accident is best prevented by allowing the forceps to remain open in the wound for a moment after completing the detachment. This has the advantage of allowing some of the blood to escape from the anterior chamber, and at the same time holds back the detached iris.

Incision of the Iris Angle. (Incisione dell angolo irideo) according to De Vincentiis (1894) is performed with a small sickle-shaped knife-needle, which is sharpened on its convex edge. The shaft of the instrument is cylindrical or elliptical and tapers toward the blade so as to prevent escape of aqueous during the section. Puncture is made 1.5 mm. from the limbus and a like distance from the horizontal meridian of the cornea, and the knife thrust obliquely through the sclera into the anterior chamber. It is then carried through the anterior chamber parallel to

the surface of the iris until, at a point directly opposite the puncture, it engages the angle of the anterior chamber and passes into the tissues there to a depth of 1 mm. The iris angle is now incised as the sickle is withdrawn, the cutting edge being turned toward the sclera, and the knife kept in contact with the angle of the anterior chamber until within a millimeter or two of the original puncture.

Tailor, De Vincentiis' assistant, recommended this procedure for all stages of inflammatory glaucoma, as well as for the hemorrhagic and simple forms, and for secondary glaucoma due to serous iritis or cyclitis or to anterior sclero-choroiditis. Czermak expresses grave doubts as to the feasibility of an exact operation except in case the filtration angle is free, *i. e.*, where the plus tension is not due to occlusion of the iris angle, but to obstructions in the ligamentum pectinatum or similar cause. In any event the technique meets with almost insuperable obstacles and the usual result would be a probably extensive operative iridodialysis.

The object of the operation is actually to open up Schlemm's canal, and the following advantages over other glaucoma operations were claimed for it by Tailor:

1. It is applicable, as opposed to iridectomy, even in cases of firmly adherent or atrophic iris, whereas in such cases the iris tears off medially from the point of attachment in attempt to perform iridectomy, and thus nullifies the effect of the procedure.

2. It can be performed in a very shallow chamber (Czermak doubts this), and opens Schlemm's canal for a long stretch, which is probably of value in case of atrophic changes in the filtration angle.

3. Tension is diminished gradually, as the anterior chamber is not emptied by the section.

4. The operation can be repeated as often as required, and causes a slight and not at all dangerous wound.

Of these modifications Czermak exclaims: "What by-paths to get around an iridectomy and yet to reach the same goal."

Querlenghi (1902) devised a procedure which he terms sclero-choriotomy. A Graefe knife was introduced into the sclera some distance back of the limbus with the cutting edge upward, *i. e.*, the back toward the interior of the globe and the point directed toward the middle of the anterior chamber. When the point appeared in the anterior chamber the handle of the knife was depressed toward the globe, and the instrument withdrawn, cutting through the root of the iris and the choroid down

to the sclera and opening up a path for the intra-ocular fluids from the anterior chamber to the supra-choroidal space. This operation does not seem to have met with favor, to judge by the fact that scant reference to it is to be found in the literature. The evident objection is the danger of hemorrhage, of injury to the lens, and further the fact that there was no guarantee of a wide and lasting channel for filtration.

A somewhat similar procedure, however, met with immediate approval, and as it is one of the few which is based on a careful study of filtration processes, a somewhat more detailed consideration may be in place. This operation was suggested by Heine in 1906, and termed by him cyclodialysis. As the name implies, it consists in instrumental detachment of the ciliary body and intact iris from the sclera, with penetration of the tissues at the filtration angle, and is intended to open up a channel from the anterior chamber to the supra-choroidal space. The scleral incision was not to play a part in filtration; the latter was to take place by the usual channels, *i. e.*, the vessels and lymph spaces between sclera and uveal tract by means of the artificially established communication.

Cyclodialysis (after Meller-Pyle, Ophthalmic Surgery, 1908). This operation by Heine was inspired by the articles of Fuchs and Axenfeld, who described the choroidal detachment following iridectomy for glaucoma and preliminary to cataract extraction, pointed out the accompanying diminution in intra-ocular tension, and concluded that the choroidal detachment was due to oozing of aqueous backward through tears in the ligamentum pectinatum caused by the operation. Heine's idea was to establish an artificial opening in the ligament, allowing communication between the anterior chamber and the suprachoroidal space, producing a detachment of the choroid which would reduce tension. It was taken for granted that the tear would not heal again spontaneously, and that the supra-choroidal space was a natural filtration channel for intra-ocular fluids or could be converted into one by operation. Neither of these assumptions was verified in practice. The expected detachment failed to appear even in those cases in which tension was markedly reduced. Lowered tension, which in successful cases may last for months, is independent of a supposed detachment of the choroid. The latter disappears in a few days, or at most in a couple of weeks, if extensive, and tension again rises. The successful results are more reasonably to be ascribed to the undermining of the angle of the anterior chamber and the

opening up of the spaces of the ligamentum pectinatum, in short, to freeing the filtration angle or rather establishing a direct communication between it and the anterior chamber on the one hand, and the supraciliary space on the other.

Technique. Incision of bulbar conjunctiva in lower temporal quadrant about 5 mm. from the limbus. Sclera exposed by undermining and retraction of conjunctival flaps. A cut 2 mm. long is made by dissection through the sclera, the tissue being divided layer by layer, the wound kept at the same depth throughout, and the cutting carried on very cautiously. The object is to divide the sclera without injuring the ciliary body, which appears as a blue black mass in the depths of the scleral incision. If a keratome is used, the cutting lateral edge, not the point, is to be used, but a fine Graefe knife is at least as suitable an instrument. If correctly performed there should be no hemorrhage from the uveal tract, and no prolapse of vitreous into the scleral wound. A narrow spatula, or iris reposer, is now introduced, and carried forward between the sclera and the ciliary body with its plane parallel to both. The blunt point should have a tendency to hug the inner surface of the sclera in order not to get behind the iris. If all the fibres of the sclera have been divided there is no resistance to the introduction of the spatula, which, as soon as its point appears in the anterior chamber, is pushed forward with lateral motions to and fro, and the ciliary body detached. This detachment is sometimes indicated by the appearance of a black crescent in the iris angle as in iridodialysis. The aqueous does not escape, unless the wound be made to gape by twisting the spatula in situ. If the ciliary body has not been injured during the scleral dissection there will be no hemorrhage into the anterior chamber.

At the beginning of the operation care must be taken to avoid injuring the anterior scleral veins, which in glaucoma are usually much engorged. This accident obscures the field, delaying operation, and blood may be sucked into the anterior chamber when the spatula is introduced. Adrenalin generally suffices to check bleeding from the small scleral vessels, but the actual cautery may have to be applied in severe hemorrhage from a ciliary vein. If the scleral cut is carried too deep the uvea may be cut through, and vitreous prolapse into the section. The entrance of the spatula into the anterior chamber takes place through the ligamentum pectinatum, which is divided, the filtration angle opened and the ciliary body, with the iris springing from it detached from the sclera.

Iridodialysis and injury to Schlemm's canal are not to be feared, as the iris arises from the anterior surface of the ciliary body, and the canal is protected by a projecting layer of sclera. After withdrawing the spatula the ciliary body resumes its original position, and the angle of the anterior chamber appears unchanged. Hemorrhage into the chamber requires the application of a pressure bandage, which causes it to absorb and prevents recurrence.

Complications. Detachment of Descemet's membrane is a not infrequent accident. If the spatula is not sharp enough to penetrate the fibres of the ligamentum pectinatum it glides in front of them on the anterior surface of Descemet's membrane, and is caught in the parenchyma of the cornea. The faulty position is recognized by marked resistance, and the spatula should be immediately drawn back to prevent detachment. The spatula usually takes the right course, even in case the root of the iris is attached to the posterior surface of the cornea (peripheral anterior synechia). After withdrawing the spatula the conjunctiva is closed by a suture, and the eye bandaged.

Character and Effects of Operation. Iridodialysis is less radical and injures and endangers the eye less than iridectomy. Meller purposely avoided escape of aqueous during operation to test the value of the procedure, with the factor of puncture omitted. Immediately after the operation the eye was, of course, as hard as it was before. As a routine, myotics should be employed after the operation, as they aid in pulling the freed root of the iris away from the angle of the anterior chamber. Aqueous may be allowed to escape by turning the spatula in the wound as described above, in case it is advisable to reduce tension immediately.

Results. The real effect of the operation is not seen until several days later, as it develops gradually. In about 30% of the cases the tension gradually sinks to normal, or even below normal, in this time; the hazy cornea clears, the anterior chamber deepens—although it is still shallower than normal.—and the pupil is less dilated. This improved condition may be permanent. In 40% the diminution of tension is temporary, and is followed by recurrence of glaucomatous symptoms in a few weeks. In about 30%, notably in absolute glaucoma, the operation is of no use at all.

Indications. (1) In primary glaucoma, in which iridectomy is difficult or dangerous, either on account of excessive tension or *intra-ocular complication*, as in absence of anterior chamber, atrophic or adherent iris, maximal dilatation of the pupil, hemor-

rhagic glaucoma; (2) where the other eye has been lost after iridectomy, as in severe hemorrhage or malignant glaucoma; (3) in old, very infirm, restless, demented, or coughing patients, as cyclodialysis does not require them to be confined to bed; (4) as a substitute for sclerotomy preliminary to iridectomy in excessive hypertension, to facilitate this procedure by reducing pressure, if only temporarily; (5) in secondary glaucoma, especially that due (a) to ciliary traction, as by anterior synechiae, which persists in spite of iridotomy, or (b) to dislocation of the lens into the vitreous (its advantage in such cases lies in the absence of danger of losing vitreous, and correspondingly greater security of result); (6) in post-operative (cataract) glaucoma, where the pillars of the coloboma are in correct position. If adherent they should be freed by iridectomy.

Meller concludes that cyclodialysis, while it will diminish tension in a certain number of cases, can not be considered preferable or even equal to iridectomy. It should not be used indiscriminately, but rather held in reserve as a valuable aid or substitute in special cases when iridectomy fails or is contraindicated.

Cyclodialysis—Modifications of Technique and Suggestions. Czermak, W., suggests cyclodialysis preliminary to iridectomy in order to obtain the smooth separation of the root of the iris from the ligamentum pectinatum, in certain cases of chronic and absolute glaucoma, in which the performance of a regular broad and peripheral iridectomy is impossible on account of atrophy of the iris and adherence to cornea. He uses a bellied scalpel for dissection of the sclera and instils eserine after the operation.

Logetschnikow, S. (Rep. Ophth. Soc., Moscow, Oct. 31, 1906), uses a scalpel in performing Heine's cyclodialysis. He reports five cases, and claims as advantages the slight painfulness, reduction of tension, and absence of bad after-effects.

According to Heine (Rep. Heidelberg Cong., 1906, Muench. Med. Woch., 1906, p. 2) the principal advantages of his operation are: Less danger than in iridectomy; preservation of normal pupil and sphincter, cosmetic effect, applicability in complicated cases, as in hemorrhagic and secondary glaucoma, or in complete abolition of anterior chamber; possibility of repetition without difficulty or danger, and, finally, maintenance of the anterior chamber.

The gradual reduction of tension, as shown by usual persistence of tension for from ten to twenty-four hours after operating, is of great value, as for instance, in hemorrhagic glaucoma and

in buphthalmus, while in cases where it is necessary to reduce tension promptly this can be accomplished with ease by tilting the spatula and allowing the aqueous to escape at whatever rate we please.

Meller lays stress on the advantages of this procedure in absolute glaucoma with hazy cornea, shallow chamber and narrow rim of atrophic or adherent iris, and in secondary glaucoma due to a lens dislocated into the vitreous, where iridectomy is precarious and often impossible. Again, in secondary glaucoma coming on after combined extraction, in which it would be necessary to mutilate the eye by a second iridectomy downward and still further interfere with vision, a procedure which would be difficult as well as of doubtful value, cyclodialysis would be the procedure of choice.

The dangers of cyclodialysis are: (1) Penetration of the vitreous in making the scleral incision. This is followed by hemorrhage and often by prolapse, which may defeat the aim of the operation. The accident may be avoided, according to Heine, by paying attention to three signs of the sclera having been completely severed. These are, cessation of resistance to the cutting edge of the knife, the appearance of the uvea as a dark blue line in the depth of the incision, and ciliary pain. This is complained of as soon as the ciliary body is touched, while the scleral incision is hardly felt after the usual cocaineization. (2) Injury to the iris. This may happen if the spatula is not held in close apposition to the inner surface of the sclera as it passes forward into the anterior chamber. (3) Hemorrhage into the anterior chamber. This is generally a result of iris traumatism. It may prevent reduction of tension and cause marked and painful reaction for a day or two. Secondary hemorrhage and transient opacity or hemorrhage in the vitreous are occasionally observed. Secondary irritation is generally noted for a day or so after operation, and disappears under eserine, hot applications, and, if necessary, morphine. There is no danger of wounding Schlemm's canal, as feared by some. Fuchs has pointed out that the spatula slides along the posterior surface of a scleral spur into the anterior chamber.

Cyclodialysis. Pathological and experimental studies as to results and mechanics, Krauss (Zeitschr. für Aug., XVII, 1907) analyzes Heine's results and reports experiments on rabbits with microscopic examinations of two human eyes, twenty rabbits' and twelve cats' eyes. In all cases a solid cicatrix had formed at the

site of operation, and the choroid was tightly adherent to the sclera by scar-tissue, as was the ciliary body. The ciliary processes were either thickened by scar-tissue or atrophic. The iris near the detachment was atrophic, and invariably adherent to the cornea. The sinus of the anterior chamber was invariably obliterated at its base by cicatricial tissue; the anterior chamber was shallow at the angle corresponding to the iridodialysis and obstructed by cells and connective tissue fibres. Posterior endothelium and Descemet's membrane were often detached at operation, causing, at times, lasting corneal opacity. Cyclodialysis produces cicatricial synechiae, and supplanting normal by scar-tissue, causes atrophy of detached parts. Post-operative diminution of tension is explained, in cases in which aqueous oozed, by puncture of the anterior chamber, with filtration through the scleral incision, in others by atrophic changes in ciliary body due to the traumatism of operation and reducing secretion of intra-ocular fluids, bringing about a natural cure and, finally, by causing iridodialysis instead of the intended, useless, cyclodialysis. The sinus of the anterior chamber can be freed, at least lastingly, from in front without injury to the eye by the usual operations.

The objections, both practical and theoretical, of Krauss have been met by Meller (*Graefe's Archiv*, 1908), who reports a series of good results, and quotes the favorable verdict of Fuchs, Uthoff, Axenfeld and a number of other experienced operators. The pathological findings in animal eyes are not to be applied unrestrictedly to human beings. As a matter of fact, cyclodialysis does produce a deep filtration angle and probably a limited detachment of the choroid, and whatever the theory may be, does reduce tension steadily and permanently. That this reduction is due to oozing from the scleral incision is disproven by its non-appearance until some time after operation. The atrophic changes postulated by Krauss as due to traumatism during operation, are not produced by the operation, and are not present to a greater degree than in other glaucomatous eyes, where, as is evident, they do not reduce tension. The operation, when correctly performed, does not cause iridodialysis, and the latter, as is well known, can not be relied upon to reduce tension, as shown by the variable and, in the main, unsatisfactory results of the procedures devised by Knies, Nicati and De Vincentiis.

Conclusions and Statistics from other Reports. Heine reports favorably on fifty cases, including some previously iridec-
torized by Uthoff. Sewall (*Calif. State J. Med.*, May, 1907)

reports one case of chronic simple glaucoma, bilateral. Three months after operation, vision as before, tension improved (but pilocarpine, used without much benefit before operation, had been continued). Boldt (*Beitr. z. Augenh.*, 68, 1907) reports results of thirty-eight cyclodialyses on thirty-seven eyes, six failures, representing all forms of glaucoma. Considerable and lasting reduction of tension, twenty-five; more or less favorable influence, thirty-one. Iridectomy to be preferred in acute and subacute glaucoma, cyclodialysis not advisable in prodromal stage, but may supplant iridectomy in simple and chronic cases. In hemorrhagic glaucoma it is less dangerous than iridectomy, as in juvenile glaucoma, dislocation of the lens, high myopia, and buphthalmus, where it is to be followed by the use of myotics.

Cutler (*Ophth. Section, N. Y. Acad. Med.*, Feb., 1906). Acute glaucoma, T.—2. wide pupil, shallow anterior chamber. Cyclodialysis. No hemorrhage, little pain, and no reaction. T. fell and remained normal for a week, then rose suddenly. The operation was repeated, but as the outlook did not seem good, iridectomy was also performed, and tension has since remained normal. In less acute cases the results may be better, but Cutler thinks the procedure valuable chiefly as a preliminary to iridectomy where the anterior chamber is shallow, especially if the coloboma can be placed at the point where the angle has been opened, thus greatly increasing the chances of maintaining a permanent patency of the filtration angle. Few of the attempts made from the anterior chamber, such as anterior sclerotomy or De Vincenti's operation, reach the ligamentum pectinatum, and even in iridectomy the root of the iris is seldom reached, so that it is still a problem why it is so often successful and how it acts.

Dolganow, W. (*Praktisch. Wratch.*, 1907), reports brilliant operative results of cyclodialysis in eleven out of twelve cases of "acute absolute glaucoma." Pain disappeared within three or four hours after operation and tension remained low while the patients were under observation (two weeks to three months). In one case there was persistence of pain, and the eye finally had to be enucleated. D. finds the operation according to Heine easily performed but very painful. Hemorrhage into the anterior chamber is usually not severe, and is absorbed completely in from seven to ten days. The after treatment is short, and the operation does not require the patients to be confined to bed.

Weekers (*Klin. Monatsbl. für Aug.*, XLV, II, 232) reviews the history of cyclodialysis, and reports five cases of his own, with

one histological examination. His experience with this procedure is not encouraging. It certainly appears to be dangerous in hemorrhagic glaucoma, and often barren of results and ineffectual in chronic forms. A definite judgment can hardly be formed until further observations have been made, but in the light of our present experience, the results in severe, protracted cases are by no means what we could wish.

Operations Based on Extra-Ocular Drainage (Trans-Scleral or Sub-Conjunctival Filtration). In this class of operations filtration was to be established from the anterior chamber through a permanent opening, or fistula, in the sclera. This sub-conjunctival fistula was to be produced either by resection of portion of the wall of the globe under a conjunctival flap, or by incarcerating sub-conjunctiva, iris, or other tissue or even foreign body, into the section, and thus preventing complete or permanent closure of the wound. These two divisions are represented by trephining of the sclera, posterior sclerotomy with massage (Dianoux), jagged sclerotomy (Herbert, 1903), combined sclerectomy (Lagrange), on the one hand, and by iridencleisis (Holth), sub-conjunctival fistula (Herbert, 1907) on the other.

Another departure was based on the good effects of iridectomy in which the scleral incision had failed to heal smoothly, and in which this abnormal healing was followed by more or less constant oozing of fluid through a permeable scar. Histological studies showed that these filtration cicatrices were produced in two ways. Either the section was irregular, so that temporary closure was afforded only by the conjunctival flap, or there was prolapse of iris or of vitreous between the lips of the wound. In the former case the scar was generally ectatic but not cystoid or protruding. In the latter case the prolapsed tissues protruded more or less above the level of the sclera, depending on the degree of intraocular tension, acting as a sort of safety valve, and giving way when the pressure reached a certain height. De Wecker was one of the first to recognize the value of a filtrating scar and devised means of so performing the scleral section as to insure its development. The substitute operation for the formation of cystoid scar form the second large group of procedures for relief of persistent high tension. In accordance with the histological data just mentioned, there were obviously two ways, theoretically, of producing a permeable cicatrix, one by intentional irregularity of the scleral section, or actual excision of portion of this membrane, to allow sub-conjunctival filtration via an open sclera, and, secondly, prevention of firm healing

by producing a prolapse of iris or of other tissue into the wound. This is the idea underlying the procedures of Holth, iridencleisis, who used the iris, and of Herbert, who invented the conjunctival flap through the scleral incision into the anterior chamber.

Herbert suggested the introduction of a capillary glass tube, and Holth used silver wire to hold the inverted conjunctiva in the anterior chamber.

Herbert (Ophth. Soc. U. K., Ophth. Rev., 1903), *sub-conjunctival fistula in chronic glaucoma*, reports forty-eight cases, valuable to replace or follow ineffectual iridectomy. Infection and sympathetic irritation are theoretical objections. Reduction of tension and relief of pain are sure and lasting, but take time, as for the prolapsed iris to become permeable, so that primary diminution of tension following scleral section may be followed by a slight increase, lasting up to two months, which is usually controlled by eserine and massage. A small iridectomy should be combined with this operation, especially if the iris tissue is thick or fibrous. Section with Graefe knife 4 to 5 mm. long in sclero-corneal margin, forming a conjunctival flap which is inverted into the anterior chamber and held in position against the posterior surface of the cornea by means of a suture.

Iridencleisis Antiglaucomatosa. Holth (Heidelberg Ophthalmological Society, 1906) notes the good effects of a cystoid scar. The latter is always a slight, accidental incarceration of the iris in the wound. In these cases the vision remained good, and tension normal. Other eyes, originally in better condition, became hard and blind in spite of the iridectomy. Since August, 1904, after experiments on rabbits, Holth systematically practiced sub-conjunctival incarceration of the iris, in order to produce a fistula into the anterior chamber. To avoid infection the conjunctival incision is placed 10 mm. from the limbus. The sclero-corneal section is 6 to 8 mm. long. This results in a bleb formation of the conjunctiva. Usually a fistula lined with pigment epithelium is formed which reaches into the sub-conjunctival connective tissue. This was demonstrated histologically in one case. The operation was performed in forty-one cases. In eleven iridectomy had preceded, and in twenty-one an iridectomy, in nine an iridectomy, was immediately added. Two cases did badly because the iris drew back into the anterior chamber on the day of operation. In three tension fell, but not quite to normal. In thirty-five cases 87% normal tension was obtained, immediately in thirty-one, after a few months in four. After one week there is some iritic

irritation. Iridectomy is unnecessary for the incarceration; it can be replaced by meridional iridotomy if a coloboma is desired. A small peripheral, angular iridotomy with incarceration of the flap should leave a round, central pupil. In previous experiments by Bader (1873) and Herbert (1903) only the anterior surface of the unwounded iris appears to have been used for the incarceration, while the posterior surface formed a blind sac which did not contribute to the formation of a true fistula. The latter can be formed only by a fold of the posterior surface of the incised iris with the pigment epithelium.

Vollert (Muench. Med. Wochenschr., 1906, No. 50) has used this procedure with good results. The section must be made at some distance from the limbus to avoid possible infection of the incision. Forty-one cases were operated on with better results than are usually obtained with iridectomy.

The dangers of prolapsed and adherent iris were avoided in the form of cystoid scar formation which depends on exsection of a portion of sclera. The principal exponent of this idea was Lagrange, who in 1904 devised a combination of iridectomy with exsection of a sliver of the anterior lip of the scleral wound, covering the section with a conjunctival flap formed by the Graefe knife during the incision which was placed 2 mm. back of the limbus and followed by a typical glaucoma iridectomy.

Production of a Filling Scar in Chronic Glaucoma. Lagrange (Ophthalmoscope, Sept., '07, Arch. d'Opht., XXVII, p. 181) makes a scleral incision with a Graefe knife, finishing with a conjunctival flap; then with a very sharp pair of slightly curved scissors cuts out a crescentic slip from the corneal lip of the wound, and completes the operation with a broad iridectomy. At the Oxford Ophthalmological Congress, Lagrange reported thirty-three successes. Eserin is instilled before operation.

The incision runs about 1 mm. back of the limbus and is intended to open up the angle of the anterior chamber. In cutting out through the sclera, the knife blade is turned slightly backward to produce a long beveled anterior wound lip and a fairly deep conjunctival flap is cut through about 5 mm. back of the scleral section. The resection is made with fine scissors, sharply curved on the flat, and the cutting is done with the convexity of the blades toward the surface of the globe. The iridectomy should be wide and extend to the root of the iris, the latter being drawn away from either angle of the wound as it is snipped off with two cuts of the scissors. During the iridectomy, the conjunctival flap is laid back on the cornea and held with forceps.

Lagrange claims that this sclerectomy at the level of Schlemm's canal produces a permanent filtration cicatrix without the dangers incident to methods involving incarceration of iris, conjunctiva, or other tissue into the lips of the scleral section. It will permanently reduce hypertension in persistent glaucoma. Simple glaucoma is merely chronic glaucoma with evanescent, intermittent, fugaceous, or slight increase of tension, and should be treated by this operation. Cases due to vascular sclerosis will of course go on from bad to worse, and optic nerve atrophy with excavation will progress, but plus tension is abolished forever.

Herbert (Ophthalmoscope, June, '07) classifies permeable cicatrices as cystoid, filtering, and fistulous. A filtering scar is smooth, and has no dark points, which are fistulae. Such a scar is common in Bombay after cataract extraction with a broad conjunctival flap. Pressure on the globe, years after operation, will cause the eye to become soft and gives rise to very distinct chemosis. This is the kind of scar, exactly, which has long been desired in the treatment of glaucoma. Herbert began by making one or both lips of a corneo-scleral incision as jagged and uneven as possible, using a narrow knife, and aiming to produce a weak scar by preventing primary union. This proved unsatisfactory, as did the method of Lagrange. He then proceeded to isolate a wedge of scleral-corneal tissue which, being cut off from its blood supply, and pushed out of place, would act as a kind of graft which should shrink and provide for filtration. The incision is small and made slowly with an old ground-down Graefe knife $4/5$ mm. wide. It must taper from heel to point. The conjunctival incision is made 1.5-2 mm. above the intended scleral section, the loose fold of conjunctiva being pushed down with the knife point. The corneo-scleral puncture is made with the blade nearly transverse and the cutting edge upwards. When the counter-puncture has been made the blade is turned in the wound and puncture and counterpuncture enlarged with the cutting edge downwards. This gives room to twist the knife again for the secondary incision which is made forward and upward in a direction normal to the corneal surface. The primary incision is then completed subconjunctivally to isolate the wedge which is quite narrow, measuring vertically $1\frac{1}{2}$ -2 $\frac{1}{2}$ mm. The conjunctival flap is cut with a narrow undivided bridge. A minute "peripheral buttonhole" iridectomy is made to prevent iris inclusion.

Henderson, T. (Brit. Med. Jour., Nov. 2, 1907), believes primary obstruction and closure of pectinate ligament due to sclerosis

of fibrous structures about filtration angle to be the main casual factor in glaucoma, all other changes, such as peripheral anterior synechiae, being secondary. All drainage then devolves on the iris. Blocking of the filtration angle is due, indirectly, to acute iritic edema, and is not, itself, a cause of glaucoma. Shallowing of anterior chamber is caused by increased diameter of the lens, as ciliary edema causes relaxation of the suspensory ligament. Meiotics stretch out iris tissue and open crypts on anterior surface, thus enlarging drainage area, while iridectomy accomplishes the same object. Henderson claims that the value of Lagrange's as well as Herbert's operation is due entirely to the coincident iridectomy, and that the cicatrix, if free from iris, must heal and be sealed up by the posterior endothelium, and by a plug of "intercalary" connective tissue from the episclera and subconjunctiva. He notes that Butler produced a filtering cicatrix after cataract extraction, but at the end of three weeks it ceased to filter and the wound healed soundly. Iris tissue seems indifferent to trauma when not complicated with toxic or septic agencies. No reparative process takes place, and no scar is formed, no connective tissue is laid down after detachment from ciliary body, and no reaction follows hemorrhage into the stroma. Years after an iridectomy the cut surfaces remain as when first severed, the anterior epithelium does not cover them nor the pigment layer grow over them, and no wandering cells cover their surface with connective tissue. In short, there remains an open, raw, and unhealed area in free and open communication with the aqueous of the anterior chamber. This explains why iridectomy is so successful in acute glaucoma: a permanent drain being opened up for the aqueous to transude into the circulation. If, however, the iris stroma be atrophic, as in many cases of chronic glaucoma, the iridectomy is often unsuccessful.

These conclusions from histological findings can not be accepted for clinical purposes without limitation. Practical experience teaches us that filtration scars, especially after iridectomy, may remain permeable for years. Wagemann and Gepner, years ago, showed that the restoration of continuity in the posterior lip of corneal and sclero-corneal wounds by proliferation of the endothelium required several months, at least, and that the process had been overlooked by previous investigators for this very reason; the glaucos having all been examined within a month or two after operation. A further objection to Henderson's conclusions lies in the nature of his material which could only show the process of wound-

healing after section for cataract extraction. Now, Czernak and others have shown that there is a radical difference in the course of healing of wounds which come into direct apposition immediately after completion, and those in which, as in most cases of glaucoma, there is a tendency for the inner lip, at least, to be kept from primary union by continuance or recurrence of high tension. The latter factor undoubtedly accounts in many cases for a condition in which we have sub-conjunctival drainage through permeable but not necessarily protruding or cystoid scar, acting as a safety valve for hypertension with regularly alternating phases of separation of the wound margins, sub-conjunctival accumulation of intra-ocular fluid, and plus tension, on the one hand, and gradual oozing, diminution of tension and coaptation of the wound on the other. This takes place most easily, of course, if the scar is formed of intercalary sub-conjunctival tissue, but even reunited scleral tissue allows some transudation, and this is not completely prevented until the continuity of the endothelium has been re-established.

Lagrange gives a report of additional cases treated by his combination of sclerotomy and iridectomy (*Arch. Ophth.*, July, 1907) which, he claims, is of special value as compared to iridectomy, in cases of simple glaucoma, a disease characterized by persistent hypertension. This is often slight in degree, almost if not quite inappreciable by palpation, and intermittent in character, so that it may be absent at the time of examination. This history is one of rainbow vision, colored halos about lights, obscuration of vision, characteristic contraction of the nasal field for white, with preservation of normal limits for peripheral color perception. In some cases, vision is hardly if at all affected, and hypertension may not be detected, but it has been present as a result of "emotion, overwork, or some moral or physical fatigue." In such cases the effect of iridectomy is transient, while Lagrange's operation permanently reduces tension.

Weeks (*Ophth. Section, N. Y. Acad. Med.*, January, 1908), presented a number of cases of simple glaucoma operated on by the method of Lagrange. Double operation in two, single in two cases. Broad iridectomies were performed. Intraocular pressure was reduced to $T + \frac{1}{2}$ in one case and to normal in the others which had been under observation from five weeks to three months. The conjunctiva over the scleral defect was oedematous. In view of the tendency for a gradual firm closure of wounds of this nature, the final results must be decided by later observation.

A review of the literature shows that it is still too early to

form a definite judgment as to the final results of either Heine's or Lagrange's operation. The favorable statistics of the latter procedure may be due, wholly or in part, to the iridectomy which accompanies it.

The fact that Lagrange's operation includes iridectomy somewhat diminishes its usefulness, too, laying it open to the same objections that have been raised to the latter procedure. This is most obvious in cases where dangerous hemorrhage is to be feared or has actually taken place in a previous operation either on the affected eye or its fellow, in cases in which the iris is atrophic or adherent, and to a certain extent in extreme hypertension with shallow anterior chamber where there is danger of wounding the lens, or where sudden diminution of tension is apt to be followed by intraocular hemorrhage, or by prolapse of iris or vitreous. The last objection is less grave, as the sclerectomy may be depended upon to diminish tension sufficiently to allow an iridectomy to be performed *lege artis* without injury to the eye.

In cyclodialysis, too, it has been advised to perform iridectomy, and so to get the undeniable benefit of a complete freeing of the angle of the anterior chamber and trans iridic drainage, plus whatever value the establishing of supra-choroidal filtration may possess.

The most evident objection to cyclodialysis is the difficulty of performing a clean operation without injuring the ciliary body. The danger of vitreous prolapse, of hemorrhage, and of detachment of Descemet's membrane must also be considered. To these purely technical difficulties we must add the possible insufficiency of the filtration channel via the supra-choroidal space, and in any case, the question of its permanency.

REPORT OF CORNEAL CASE.

J. W. KIMBERLIN, M. D., KANSAS CITY, Mo.

This case has many points of interest and it does not fit in with any regular classification that has been found in the literature of corneal troubles.

Hope S., age 11, Cleveland, Mo. O. D. V. nil. O. S. V. 1/60. Presented privately April 16, 1908, with the following history: Had whooping cough at eight months after which "scum" came over both eyes. Eyes were treated for five or six weeks and cornea seemed to clear up, but the cloud in a few weeks returned over both eyes and has since been there, gradually getting more dense. A few years ago parents noticed that right cornea was very dry and that the child would pick at the cornea, removing secretions seem-

ingly without pain. Has had nasal catarrh which parents say was cured, but a small section of nose was eaten away. Has had no other diseases but mumps. Child is strong and robust, splendid appetite, bright and intelligent. Parents health always good. No specific history or tubercular history except one of father's four brothers died of quick consumption. Four other children, two older and two younger than patient, with no eye trouble and in splendid health.

Examination shows *right cornea* very dry, total anesthesia, dense leucoma so that iris can not be seen, and macerated around a small scab in the center, stringy flakes of mucus extending from cornea. Conjunctiva, ocular and palpebral, normally moist, slightly congested and but slightly anesthetic. No circumcorneal injection, slight staphyloma; perfect closure of lids.

Left eye: Cornea hazy with striae in corneal substance. Cornea dryer than normal, but entire conjunctiva normal. Complete anesthesia of cornea. Pupil responds normally to atropine. There is practically a complete absence of nictitation. Cornea takes a light yellowish stain all over with fluorescein. Facial examination shows rather a peculiar skin condition on forehead, wrinkled, dry and some discolored patches. Sore on upper lip under right side of nose. Several scars on face from slight injuries. Triangular section gone from right side on nose.

The interesting points here are the extreme dryness of the cornea and the complete corneal anesthesia. It can not be a keratomalacia following xerosis conjunctiva as the dry, foamy typical patches on the conjunctiva are absent. In fact the conjunctiva is not involved. We have here a healthy robust child with this corneal condition dating back for years. Xerosis conjunctivæ attacks children much emaciated, who do not long survive. I have been unable to find a report of keratomalacia independent of xerosis conjunctivæ. It is not a case of lagophthalmic keratitis. There are no active ulcers in either eye. The whole cornea is involved while but the exposed part would be in an exposure keratitis, and yet the dry and macerated condition may be somewhat dependent on the exposure incident to the absence of nictitation. There is nothing indicating a tubercular or malignant condition.

With the foregoing diseases eliminated we have left then a neuro-paralytic keratitis and this seems to meet the condition. The disturbance is of the sensory and trophic fibres of the trigeminal nerves supplying the corneæ. While no other anesthetic areas can be demonstrated in the distribution of the fifth, the deformity in

the nose and the scars after slight traumas over the face carries out the trophic disturbance idea. The etiology is very vague. No mention of a paralysis of this kind following whooping cough has been found.

The treatment given has been of course mostly empirical. The child has been on the mixed treatment for four weeks without any change in its condition. This has been supplemented by oleum ricini, one drop in the eyes twice daily. The parents are compelling her to wink the eyes for regular periods every day. Strychnia nitrate will be given later. The question of suturing the lids together has been considered, but it would hardly be fair to rob the child of what little sight she has, even temporarily, when good results could not be assured.

532 Altman Building.

A CASE OF PYRAMIDO-ZONULAR CATARACT.*

BURTON CHANCE, M. D.

FROM THE SERVICE OF DR. SCHWENK, WILLS HOSPITAL, PHILADELPHIA.

(Illustrated.)

In our experience the following case is unique. We regarded it as one of pyramido-zonular cataract occurring in a person of fair general health who exhibited no signs of rachitis.

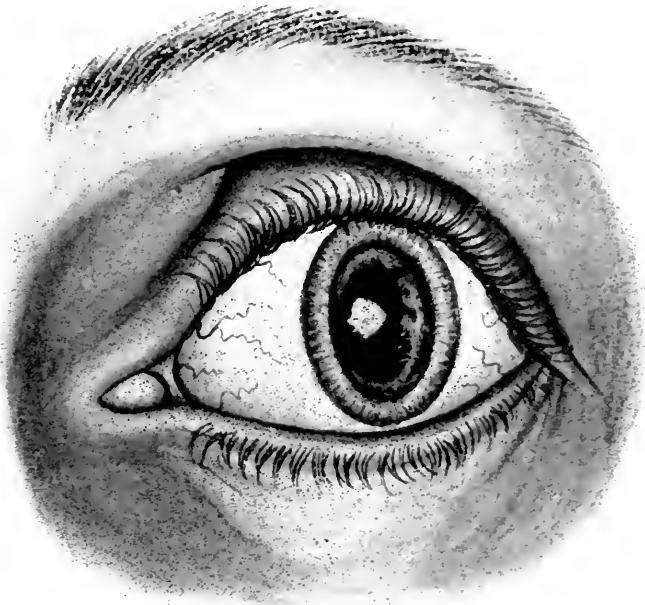
Miss B. K., aged 24, unmarried, came to the hospital on September 29, 1908, because of defective sight, and because she had been told she had a cataract. When six months old she had an attack of measles, shortly after which, she said, her mother noticed a white spot in the center of the pupil of the left eye. She had been rather delicate, and had had nearly all the fevers and other diseases of childhood and adolescence. She is the second of five children. Her father died of consumption when she was four years of age, and her mother of hemorrhages seven years ago. She had been examined by a number of oculists; various opinions had been given as to the cause of the opacity, and as to the prognosis in general.

The vision of the right = 6/15, of the left = 2/60. There is a slight, very rapid, horizontal nystagmus in the left eye, which is quite pronounced when the pupil has been widely dilated.

When the mydriasis is complete a dense white opacity is seen occupying the anterior pole of the lens, while near the periphery,

*Presented at a meeting of the Wills Hospital Ophthalmic Society, Monday, October 13, 1908.

deeply situated, is a gray irregularly broad ring. This ring has uneven edges and projections, and may be looked upon as a zonular cataract. The central opacity is conical; the apex points anteriorly and appears to be wholly in the substance of the lens. At the base, which is near the nucleus, there are rough projections extending laterally from it. With oblique illumination there appears to be a fine haze of each cornea, and yet, even upon high magnification, no opacity of the cornea can be made out. The vitreous of the left eye is perfectly clear. The disc is oval and extending



Pyramido-Founlar Cataract.

from the upper border is a flame shaped opaque patch of retained nerve fibres. The general refraction is $+7$ D. In the right eye the lens has a very faint haze in it at about the situation of the zone noted in the left. This eye is also highly hyperopic, but it is otherwise healthy and normal. The correcting lenses increase the vision to $5/10$ in the right, and to $5/30$ in the left.

These opacities are evidently stationary, and as the acuity of vision is high, we believed that operative interference would be unwarranted at this time.

The drawing made by Miss Washington gives a very good view from oblique illumination, except, in it, the apex of the central opacity appears to point toward the zone, whereas it actually projects straight forward.

SOME GENERAL CONSIDERATIONS CONCERNING
TUBERCULOSIS OF THE EYE.*

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The subject of ocular tuberculosis, it seems to me, may be better understood by considering it from the standpoint of the character of the tuberculous process rather than from that of the location of the lesions. From this point of view the first question to present itself is whether or not the infection is primary. There can be no doubt that in the great majority of cases the ocular disease is simply a part of a systemic infection, and that primary tuberculosis of the eye, if it ever occurs, is too rare to be of practical importance. The question thus appears to be purely an academic one and, in fact, at present impossible of solution. Certainly it is not possible in an individual case to demonstrate clinically that the ocular infection is primary, and the difficulty is sufficiently great even at autopsy. I have seen one case in which a tubercle of the iris followed a perforating injury, but its mild character and its satisfactory response to tuberculin therapy led me to believe that the infection was metastatic and probably due to the lowered resistance of the injured eye.

Considering, then, all cases as secondary, tuberculosis of the eye may be classified into three well defined types, namely: acute, chronic, and phlyctenular. The acute type is characterized clinically by its tendency to destroy the eye, and histologically by caseation of the lesions. Under this head I should classify some cases which from a general standpoint would be considered chronic, yet relative to the chronic type described below are distinctly acute. This type of ocular tuberculosis is exceedingly rare; at least this is true if all cases are excluded in which the ocular lesions have occurred so shortly before death as to become of little practical importance. Nevertheless, until recently this was the only type of ocular tuberculosis clearly recognized as such in the literature. This was due to the fact that the eyes often came to microscopic examination and presented the classical histological characteristics of tuberculosis. Owing to its rareness, few ophthalmologists meet with a sufficient number of cases to teach them to diagnosticate the condition clinically. As an illustration of this fact, I may refer to a typical case of acute tuberculosis of the iris, which passed through the hands of some of the most prominent ophthalmolo-

*This work, by a somewhat condensed, made in a discussion before the surgical section of the International Congress on Tuberculosis, Washington, September 28, 1908.

gists in the country, without the true diagnosis being once suggested until the enucleated eye was submitted to me for microscopic examination. Hitherto the prognosis in this type of tuberculosis has been most unfavorable, not only as regards sight, but also as regards life. No doubt, however, some of the cases would respond to modern methods of treatment.

The chronic type of ocular tuberculosis is characterized clinically by its slow course, its tendency to show exacerbations and remissions, and histologically by the absence of caseation. It does not lead to complete destruction of the eye, but usually to atrophy in a greater or less degree. Enucleation may finally be required, however, owing to the development of secondary glaucoma. On the other hand, some cases go on to spontaneous recovery. When occurring in the form of anterior nodular scleritis or sclero-keratitis, it has long been recognized as presenting a characteristic clinical picture, but has been ascribed mainly to other causes, notably to rheumatism and to disturbances of menstruation. Within the past few years, however, the diagnostic use of tuberculin has left no doubt as to the true cause of these cases. The facts that the clinical features are so different from the acute type of ocular tuberculosis, and that the eyes are seldom enucleated except in the atrophic stage, when the characteristic histological features have largely disappeared, no doubt explain why other causes have been sought. The prominent place assigned to rheumatism as a cause, I think may be attributed to the fact that many of the patients have tuberculous arthritis of a chronic type analogous to the ocular affection. I am led to this belief from the frequency with which I have observed local tuberculin reactions in joints in these cases. It would seem that disturbances of menstruation really may be of some importance in bringing about the ocular condition, although not the direct cause, as has been supposed. I have frequently noticed that cases of scleritis become worse during the menstrual periods, and, as I have suggested elsewhere, it may be this repeated lowering of the resistance which gives the opportunity for ocular metastases to occur. The far greater frequency of this type of tuberculosis in women certainly accords with this view.

While scleritis and keratitis are perhaps the most important manifestations of the chronic type of ocular tuberculosis, other structures of the eye may also be attacked, especially the iris, ciliary body and choroid. In cases of scleritis the iris is frequently involved, either in a general sluggish iritis, probably representing a reaction at a distance to the tuberculous foci, or in a nodular iritis

dependent upon the presence of foci in the iris itself. Similarly the choroid on ophthalmoscopic examination may show a greater or less number of hazy gray areas, or, at a later stage, sharply defined white patches, often mistakenly attributed to syphilis. Tuberculous keratitis occurring alone, while theoretically possible, seldom actually occurs. Most often there is either an active slight scleritis also, or evidence of an old scleritis. While scleritis is apparently absent, it is probable that the process has extended into the cornea in a more direct way from the ciliary body.

One of the most noteworthy features of the chronic type of ocular tuberculosis is the apparent general healthy condition of the patients. The temperature is usually either normal or subnormal. Even under unfavorable conditions the prognosis in regard to life seems to be excellent, in striking contrast to cases of the acute type. The lungs are almost never involved to an alarming extent; in fact, the internist usually returns a negative report on physical examination unless informed that a tuberculin reaction has been obtained, in which case he is apt to find some indefinite signs in the chest. It would seem most likely that the primary lesions were in the mesenteric or bronchial lymph glands. This seems all the more probable since recent investigations go to show that even in pulmonary tuberculosis the infection most frequently takes place by way of the intestinal tract and lymphatic system. The explanation of the chronic character of the process is also at present problematical. It seems to me most likely that it is due to great natural resistance on the part of the patients, the bacilli obtaining a foothold only through a temporary lowering of this resistance. Possibly, however, it is due to low virulence of the infecting bacilli, the latter perhaps belonging to the bovine or avian type. If the views of Debre are to be relied upon it may be possible to solve this question by means of his differential cutaneous tuberculin test.

In the treatment of these cases I have, when possible, combined fresh air, proper diet, rest, and the use of Koch's old tuberculin. Probably no better opportunity to study the effect of treatment could be hoped for than is afforded by cases of scleritis and sclero-keratitis, where the lesions are exposed to direct observation. For this reason, and also because they are relatively common, it is to these cases that I have given special attention. In those cases in which I have postponed the use of tuberculin the rapid improvement which has followed its use later has been so striking as to leave no doubt of its value. My results lead me to

believe that the therapeutic use of the old tuberculin has been too hastily abandoned in favor of the new tuberculins. For the best results I am now convinced that it is necessary to obtain at least once either a general or local reaction. The rapid improvement following a sharp local reaction is in some cases astonishing, and in none of my cases have permanently bad results followed. Following a reaction I always allow at least ten days to elapse before another injection, and try to have the dose sufficient to just fail of a reaction. When there has been no reaction the succeeding injections are given at four day intervals. Injections are always omitted just before or during a menstrual period. I am inclined to believe that still more rapid improvement might be obtained in these chronic cases by producing a reaction at each injection with intervals of two weeks or more, but I have hesitated to adopt such a plan, owing to our preconceived ideas regarding the danger of tuberculin. These cases, however, have such great powers of resistance that it does not seem possible that harm could result.

In the cases reported in the literature in which tuberculin has been employed as a curative agent for ocular tuberculosis, little or no attention has been given to the hygienic treatment. It seems to me, however, that the best results with tuberculin can be expected only when the resisting powers of the patients are at the same time raised to their utmost by proper hygienic measures. Not the least important of these is rest. In the past fresh air has often been recommended for such cases, but it has always been combined with exercise. As the result of exercise, a long walk, I have several times seen scleritis undergo acute exacerbations. Rest is essential until the inflammation has almost if not quite subsided. The diet should consist largely of milk, butter and eggs. Although at the outset these patients are seemingly well nourished, during the treatment they gain still further in weight and take on a still more robust appearance. It should always be impressed upon the patient that the disappearance of the inflammation is no indication that the bacilli have been destroyed, and that a recurrence may take place at any time the resistance is permitted to become lowered.

In practice it is not always possible to carry out the treatment just outlined. Often the patients have not sufficient means to allow them to give up work and remain at home. This difficulty is not overcome by admitting them to hospitals, because eye hospitals at present are not so constructed or managed as to furnish the necessary diet or fresh air. The problem, however, could

no doubt be solved in large measure by establishing tuberculosis classes in connection with the eye hospitals, similar to those inaugurated by J. H. Pratt for pulmonary cases.

The phlyctenular type of ocular tuberculosis, the most common and important of the three, is so well known that any description here would be superfluous. Probably it is not strictly correct to speak of it as a type of ocular tuberculosis, since there is no satisfactory evidence that tubercle bacilli are actually present in the ocular lesions. That the disease is always dependent upon systemic tuberculosis, however, there can be no reasonable doubt. The clinical evidence alone is sufficient to establish this fact. The chief difficulty lies in the explanation of the ocular lesions. That they are due to the direct action of tubercular toxins, as has been suggested, seems improbable, since it is in the cases of less active tuberculosis that they are most apt to occur. I have recently suggested that the lesions are dependent upon the phenomenon of anaphylaxis. Let us suppose that in early life, perhaps in infancy, an infection with tubercle bacilli takes place and is followed by recovery. In accordance with the phenomenon of anaphylaxis, all the tissues might be sensitized by the tubercular toxins, but some more markedly than others. If the child continues to live under satisfactory hygienic surroundings and remains otherwise healthy, no harm will result. But suppose, on the other hand, that the child is attacked by some infectious disease such as measles, or its resistance is lowered in some other way, so that the old bacilli become active again or a fresh infection follows. Under these conditions the tissues previously electively sensitized will react to the fresh supply of tubercular toxin, thus producing the characteristic ocular lesions. Possibly the chronic rhinitis, eczema, and adenoid hypertrophy, which are so intimately associated with phlyctenular disease of the eye, are to be explained in the same way. The fact that phlyctenular conjunctivitis has followed the application of the ophthalmic tuberculin test in tuberculous individuals goes to support this theory, as does also the close resemblance to eczema of the eruption following the cutaneous test. This theory would explain the fact that phlyctenular disease occurs chiefly in children, seldom in infants or adults. It would explain why all cases do not give positive responses to the tuberculin tests, since at the time the tests are made the patients would have been rendered "refractory" by the fresh supply of toxins in the blood.

While I think the diagnosis of ocular tuberculosis can be made with considerable accuracy on clinical appearances alone, I

consider it an advantage to make the subcutaneous tuberculin test in all cases. This is so because the reaction obtained not only makes the diagnosis certain, but, in the chronic type at least, is ultimately beneficial, and, moreover, gives a clue to the dosage to be used in treatment. Judging by my own experience, in the chronic type of cases it is a useless waste of time to give an injection of less than 1 milligram for the first diagnostic dose. If no reaction is obtained this should be followed in 48 hours by 10 milligrams, and the test should not be considered negative unless no reaction follows a second injection of 10 milligrams, given at the end of another 48 hours. A local reaction will be obtained in the majority of cases, but not in all. In fact in exceptional cases the eye becomes distinctly less inflamed. In these few cases any possible remaining doubt as to the nature of the ocular condition will usually be removed during the tuberculin treatment, either by local reactions then obtained or by the rapid improvement following.

The newer tests for tuberculosis would seem at present to be of very limited value so far as the diagnosis of ocular tuberculosis is concerned. The ophthalmic test in my opinion should never be used for this purpose, since it is not entirely free from danger to the eye. Moreover, it is unsatisfactory because the affected eye can neither serve as a control nor be used for a second instillation. The cutaneous test is free from these objections, is more definite, and may be repeated as often as desired. Both tests are evidently based on the same principles, so that in general the results should be the same, except that in the ophthalmic test the chance for error would seem to be greater. In an individual case a negative response to either must be regarded as of considerable significance, but a positive result, which is obtained in the majority of all cases, throws no light on the ocular condition. So far as we know at present a positive reaction might be obtained in a case in which the tuberculous lesions had been free from living bacilli for years.

OPHTHALMIC AND AURAL LABORATORY DIAGNOSIS.*

DON M. CAMPBELL, M. D., L. R. C. S. (EDIN.).

DETROIT, MICH.

In the first half of the last two decades the brilliant advances of operative surgery illuminated the medical world almost to the exclusion of internal medicine, but in the last ten years surgery has had a sturdy competitor for the attention of the medical profession in the startling advances of laboratory diagnosis in all branches of the healing art.

Ophthalmology and otology were quick to take advantage and turn to their own uses what modern aseptic surgery had to offer in the way of improved operative technique and they have not been slow in assimilating also all the marvelous opportunities for the refinements of diagnosis presented by laboratory workers the world over.

However, what is most needed now for still further progress, is a closer inter-working of the mind attuned to the observation of clinical phenomena with that developed along the line of scientific laboratory research.

No such thing as conflict between these two methods of diagnosis will be tolerated in the mind of the professional man anxious for progress and advancement.

The phase of the work which has perhaps most impeded general advance of these diagnostic methods in the body of the medical profession has been the fact that to the busy practitioner it is almost an insurmountable difficulty to gather the various secretions—make cultures of pathologic germs and supply the blood of many patients for clinical laboratory research.

The sending of patients to a clinical laboratory is also cumbersome and in many instances this is neglected or so objected to on the part of the patient that it proves impracticable.

A far better way would be for groups of progressive physicians to regularly employ a laboratory man to do all of this laboratory diagnosis work and to be always accessible to make cultures, secure pathologic specimens and most important of all make the various kinds of blood examinations.

Practically, of how much real value would such work be to the busy eye and ear surgeon and to his patients?

Personally, as far as I am concerned, the answer to this query is that the value to the doctor and his patient is immense and

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once fully realized it becomes an absolute necessity to the doing of the best work that is in us to do.

It has seemed to the writer that the best and most forceful way in which to support this last proposition would be to briefly review some of the things that are daily being done in our midst and to support such statements as are found necessary to be made by clinical reports of cases actually seen during the past two years always with the hope that a comprehensive though perhaps incomplete view of the subject may bring some of its most important phases enough into relief to be impressive.

The oldest kind of laboratory research is that which deals with the renal secretions and it would be uninteresting to do more than refer in passing to the important relations existing between diabetes or Bright's disease and certain well known pathologic conditions of the eye.

There is, however, one feature of a complete urinary laboratory diagnosis other than the presence or absence of albumen or sugar which carries with it an important message in many instances for the ophthalmologist.

There is a great group of inflammatory manifestations involving the whole or a part of the uveal tract the etiologic factor of which is an autointoxication originating in defective digestive activity some place along the alimentary tract.

Now then, this same autointoxication produces a well marked pathologic condition in the urine known as the Indican reaction, so *a priori* it can logically be said that a well marked Indican reaction in the urine of a patient suffering from a general or circumscribed inflammation in the uveal tract is strong evidence that the difficulty is in his alimentary canal and will best respond to treatment which is calculated to correct the difficulty at that point. If syphilis and tuberculosis can be eliminated the Indican reaction becomes a positive means of diagnosis.

This will be found to be particularly true in relapsing iridocystitis, choroiditis and occasionally in optic neuritis. Many cases of this character could be reported.

In passing it is only seemly to refer to the great debt ophthalmology owes to the laboratory researches of Roentgen.

Next in point of time comes the researches in the laboratory dealing with bacteriology.

To bacteriologic research ophthalmology and otology owe much.

A great deal of work has been done on the bacteriology of the

conjunctiva and the middle ear and out of it many important things have come, for instance, "The Morax Axenfeldt diplobacillus conjunctivitis and its almost immediate cure by sulphate of zinc solutions." Diphtheritic conjunctivitis and its cure by antitoxin, and in the middle ear suppurations, the determining of the various forms of infection has some bearing on the probable course of the suppuration and in not a few cases a very decided influence upon the employment of the most effective plant of treatment.

The exploding of the theory of the bacteriocidal action of the tears and the establishing of the fact that the serum poured out from the surcharged conjunctival vessels carries with it the real curative element, offers a good explanation of the valuable action of such irritating substances as silver nitrate and copper sulphate. No doubt much of this so-called antiseptic effect is due to their ability to call to the parts an increased blood supply and with it much of nature's bacteriocidal serum.

In many cases of severe and intractable chronic conjunctivitis, especially those subject to unaccountable relapses, I have found the staphylococcus pyogenes albus to be the pathogenic germ in the case and when that germ is found the salts of silver are not well borne and do not produce good results. Such an infection will respond best to hot water, sulphate of zinc, yellow and oxide of mercury and iodonin. Internally sodium salicylate is a valuable remedy in this infection.

The cornea is often hazy with this kind of infection, but it is not trachomatous and there is no pannus.

Such an infection was that of J. D., aged 39, a truck driver. Had had many attacks of severe and intractable conjunctivitis. After I saw him he was given argyrol 25%, followed by protargol 2% and silver nitrate 2%, all of which proved ineffectual and highly irritating.

He was then placed on zinc drops, yellow oxide of mercury ointment and internally salicylate of soda. His recovery was slow but steady and finally perfectly satisfactory.

My experience with this work teaches me that staphylococcus pyogenes aureus infections respond quickly to silver applications, while the staphylococcus pyocyaneus (green pus infection) respond best to mercuric antiseptics. They are all benefited by hot water applications and by sodium salicylate internally.

In connection with the bacteriologic phase of this subject, these two further clinical observations are interesting:

Master G., aged 12 years, was brought to me in February,

1908, from a rural district with a history of a very much inflamed and swollen eye for 4 or 5 days. An examination showed the lids to be intensely swollen and hard. Could not open the eye—a thick membrane was found covering the conjunctiva of each lid. Chemosis well marked, cornea clear, a thin sero-sanguineous discharge and in addition to this two deep, gray, punched out, sloughing ulcers about the size of the butt end of a slate pencil on the border of each lid.

This patient was sent to the Detroit Clinical Laboratory for bacteriologic diagnosis, with a request to make separate culture from the conjunctiva and from the ulcers of the lids. The report was Klebs-Loeffler bacillus from the conjunctiva and from the ulcers, staphylococcus pyogenes albus. Antitoxin brought about a complete cure of the conjunctival infection.

Three or four days after his visit to me there appeared on the skin of each lid just above and below the ulcers on the borders two vesicles of exactly the same size as the ulcers. They became umbilicated—the serum changing to pus—they ruptured and left two ulcers—a typical cow-pox infection and we were able to find the cow with the infected udder. One of the boy's duties had been to milk this cow. Here was cow-pox and diphtheria running a simultaneous course in the same lid.

Mrs. S., aged 57 years, consulted me in January, 1908, with the history of three days of pain in the ear following la grippe. Examination showed an acute otitis media with inflamed and bulging ear drum. Made a free paracentesis and sent her home and to bed; pain continued, mastoid tender and in two or three days the external auditory canal became infected and several furuncles formed. These were opened under gas anesthesia but reformed simultaneously. A boil came under her arm, several in the scalp and she presented the appearance of general furunculosis.

In ten days the auditory canal furunculosis was under control, swelling all gone, but mastoid remained tender and perforation in tympanic membrane persisted in spite of local and constitutional treatment, as did also the general furunculosis.

At this time the advisability of doing a mastoid operation was seriously considered. Urine normal. Moderate polymorphonuclear leucocytosis. Looking at the case in all its aspects I was loath to open the mastoid and sent her to Dr. Hutchinson for bacteriologic diagnosis and his opinion as to the advisability of placing her on opsonic vaccination. I append his report.

The only other two cases I wish to report in this connection

are two infections of the middle ear with the Klebs-Loeffler bacillus, which I report on account of the rarity of this form of intra-tympanic infection.

Perhaps the most important phase of laboratory diagnosis the eye and ear surgeon encounters is that which is involved in the various kinds of *blood examinations*.

In this connection it seems apropos to refer briefly to the following conditions as revealed by systematic blood examinations in eye and ear patients.

Many cases of asthenopia which have been rebellious to cure from careful and accurate correction of refractive errors and muscular unbalances have exhibited typical blood tests for various forms of anæmia showing a reduced number of red blood cells and also a reduced hæmoglobin reaction; furthermore, the correction of such condition by suitable hygienic dietetic and medicinal management has, in not a few instances, brought about a disappearance of the asthenopic symptoms.

Very many cases of this character could be cited.

The count of the white blood cells has its chief value to us in indicating, as it does in all surgical cases, the presence of a focus of inflammatory irritation in the body or in the case of the polymorphonuclear leucocytosis, indicating a general septic invasion of the system from the local focus of infection in the ear.

In these cases the following case is of some general interest as indicating, first, the lowered power of the blood to fight and expel an infection, and in the second place showing the action on the blood of one of our commonest forms of internal medication.

Mrs. S. came in July, 1908, suffering intensely from an acute irido cystitis; all the classical symptoms were present.

In searching for an adequate etiologic factor in the case, syphilis, rheumatism, gout, uric acid, diathesis and tuberculosis could be definitely eliminated.

The urine showed a decided indican reaction and leucocyte count, which for a woman should be 8,000, was barely 6,000. These two factors seemed to offer an adequate explanation, a reduced resistance and an autointoxication or an autoinfection.

Under salicylate of soda given in physiologic doses the blood count in one week showed an increase to 7,000, and there was a decided improvement in the eye condition, but the other eye showed a decided tendency to the same form of inflammation.

The treatment was continued and in two weeks the recovery was complete and a blood count showed a trifle over 8,000.

The eyes now remained well and a third blood count six weeks later showed a normal blood.

How does salicylate of soda bring about a cure of inflammatory action in the uveal coat of the eyeball or in the sclerotic?

No doubt by its power to increase the part of the blood which is nature's weapon in combating infection of various kinds—in other words, by inducing what might be termed a medical leucocytosis.

Another interesting clinical observation is the following case:

Mrs. F., aged 57, consulted me in June, 1908, with the complaint that for three months she had been unable to see clearly with her right eye. Ophthalmoscopic examination showed everything to be in a normal condition, excepting that there were a large number of small and large retinal hæmorrhages scattered over all parts of the fundus. There were also a few in the periphery of the left fundus. O. D. V., 6/30. O. S. V., 6/6.

What caused these hemorrhages? Renal secretions normal in every respect. History was negative as to syphilis, tuberculosis and rheumatism. She had a high tension pulse. Some suggestion of atheroma, not decided, however; but she had a very red face, which in one of her age could not but attract attention. Not the purple red of poor circulation, nor the enlarged skin capillaries of the advanced in years, but a bright red complexion.

A blood examination showed a somewhat rare condition, viz., a decided increase in the number of red blood cells—a condition known as polycæthemia rubra.

Was this blood state with its high pressure and slight atheromatous condition of the arteries responsible for the retinal hemorrhages?

She was placed upon a diet and given eliminative medication and potassium iodide internally. An examination last week showed a normal blood—all the hemorrhages gone and a visual acuity of 6/15. The pulse is still high in tension. The radial artery still a little hard. Her complexion has assumed a much more normal condition. She feels better bodily.

Sometimes a consideration of the blood conditions will rescue us from grave surgical errors as, for instance, in the following case:

R. M., a boy, aged 5 years, had la grippe a year and a half ago from which he made a very slow recovery. There was at that time an acute otitis media, the discharge persisting for several weeks.

The ear, however, became finally dry and the child made a tentative recovery. Then two months ago the same cycle of events took place, excepting that at this time there were added hemorrhagic skin lesions over the boy's arms and chest. The child was colorless, weak and looked badly.

When brought to me for consultation the idea was that it might be suffering from a general sepsis originating in the middle ear suppuration, which had now existed for six weeks, and there had also been occasional periods of mastoid tenderness. There was a degree to a degree and a half of temperature. Pulse, 90 to 100.

The problem to solve was this: Was this child suffering from general septic infection from the ear, or was it the victim of some grave degenerative change and the aural suppuration only an incident? I must confess that clinically the question was a puzzling one, with the decision leaning slightly to the latter hypothesis.

Of course the question perhaps could have been answered by opening the mastoid, but at great risk to the patient.

In this case a laboratory blood examination cleared up the diagnosis decidedly and unequivocally.

The report came back that there was no leucocytosis, no polymorphonuclear leucocytosis, but that it was a clear case of leukemia and that under the best possible conditions the child had only a few weeks to live.

What a dreadful surgical error it would have been to have operated upon such a case.

Lastly, a few remarks should be made on what laboratory research has done for the diagnosis of ocular tuberculosis and the ophthalmo-tubercular reaction of chalmette should at least have a passing notice.

There are a large number of obscure corneal, scleral and choroidal lesions which have been classified along with syphilitic and rheumatic lesions of these tissues which are now capable of diagnosis and treatment by the use of diagnostic and medicinal injection of various kinds of tubercular vaccines.

Specific precipitations in the blood serum of syphilitics is the latest important result of laboratory diagnosis as bearing upon the work of eye and ear men and I have two cases to briefly report bearing upon this new and live subject.

Mrs. J., aged 39 years, was sent to me in May, 1908, for consultation and diagnosis of a persistent and painful eye infection

which was rapidly destroying her sight. Upon examination I found a condition which I diagnosed as trachoma with corneal ulceration and advised the usual treatment.

In a month I saw her again and there was no improvement. Bacteriologic examination of the conjunctival secretion showed a staphylococcus pyogenes aureus infection. Urinary and blood examination was negative.

Was the corneal lesion tubercular? She was placed in the hospital and subjected to diagnostic doses of tubercular vaccine with a negative result. Three weeks ago her blood was examined as to the presence of syphilis and a positive reaction found. Since that time she has made decided progress towards recovery under anti-syphilitic treatment of the mixed variety.

Mrs. M., aged 34, was taken suddenly with a pain behind the right ear severe enough to banish sleep.

The messenger who summoned me stated that she was deaf and had something the matter with her throat, also that there was a swelling behind the ear. It is needless to say that what was expected was an acute suppurative otitis media with mastoid involvement.

On the contrary, however, what was found was a perfectly normal tympanic, excepting for a chronic sclerosis and a swelling exquisitely tender, not over the mastoid, but further back over the lateral part of the occipital bone. An examination of the throat showed greatly swollen and very red arytenoid cartilages.

Clinical history: This woman was living with her second husband, the first one, she stated, had been "a bad man and diseased."

She had had a throat lesion for months which had proved intractable to treatment. Also she gave a history of a sore or ulcer over the lower spine and sacrum which had refused to heal until she had been put in the hospital and vigorously treated locally and constitutionally. Just what kind of treatment she had received it was, of course, impossible to find out.

Did this woman have syphilis and was the swelling at the base of the skull a gumma about to break down? Was the throat lesion a syphilitic one?

How could we tell? The lesions themselves were not pathognomonic; the history was suggestive, but not characteristic.

Her blood was examined and it gave the positive reaction for

syphilis. She is making a good recovery under potassium iodide and mercury.

Laboratory diagnosis has done, among other things, these for ophthalmology and otology:

1. Supplied one positive and several suggestive means of combating conjunctival inflammation. This is capable, the writer thinks, of great extension, and good practical results will come.

2. It has given us a method of combating infections by means of certain vaccines and serums. Their action, however, must ever remain subsidiary to the securing of good surgical drainage. They will, however, in certain instances, be found valuable when surgery has accomplished all it can and still Nature's reparative powers seem inadequate to the task of repairing the pathologic and surgical damage.

3. A definite method of diagnosing autointoxication originating in the alimentary canal.

4. A definite method of diagnosing tubercular lesions.

5. A definite means of diagnosing syphilis.

6. A definite means of accurately gauging Nature's reparative powers in any given case.

And the end is not yet.

In working out these few little problems I wish to acknowledge the help given me by Dr. Neal L. Hoskins, Dr. J. S. Hamilton, Dr. W. H. Hutchins and the Detroit Clinical Laboratory.

57 WEST FORT STREET.

DISCUSSION.

Dr. Laetus Connor: Dr. Campbell has given us a good exposition of the practical value of the laboratory in eye and ear cases. The microscope and other laboratory instruments have done much and are likely to do more for the workers in this field of medicine. As these aids improve the practice of ophthalmology will become more and more an exact science. The microscope helps not only in discovery of the cause but also in observing the progress of many cases. I have not found the indican reaction so helpful as Dr. Campbell in the detection of toxemias arising from the large intestine. No part of the anatomy, however, calls for as much attention in chronic eye and ear infections as the large intestine. I have, however, gotten more help from the study of the *urine* in these conditions than from the urine.

The paper tonight emphasizes the growing interdependence of ophthalmology and internal medicine. Medical science grows largely by the application of scientific discoveries in other fields to clinical medicine. In a general way we have to build up the immunity of our patient, and I have always found the local use of hot water as a very efficient aid to this end.

Dr. Goux drew attention to the great interest in this work on the continent. In one case in Vienna a culture was taken from a cataract eye and only benign organisms found. The eye was then operated and lost. When the patient came back for the second eye a culture from it showed the same benign organism. Further cultures were then taken at different times of day and the eye in the early morning showed pathogenic bacteria. This condition was then treated and a successful operation followed.

Dr. Sanderson called attention to the great stimulus to ophthalmic surgery given by aseptic methods when they came into vogue about twenty years ago. The trend now is toward a more accurate diagnosis and less of the cutting and seeing spirit. The serum diagnosis of syphilis certainly offers great hopes of increased exactness of diagnosis. The limitations of these methods as well as their value must be borne in mind. Thus the leucocyte count is of great value in marking the progress of many cases, yet at times even this may be misleading if relied on too exclusively.

Dr. R. Connor said that just as the progress in histology has been largely due to new stains and new chemical methods, so the progress in ophthalmology depends on new methods and new points of view which come largely from without. We are compelled to take up many things which, while they fall far short of the enthusiastic claims of their discoverers, still leave a modicum of practical value to the practitioner. The paper has emphasized the close interdependence of our specialty with internal medicine.

Dr. Beattie said that these methods will substitute for mere guesses accurate diagnosis.

Dr. Maire reported a cataract case which, after extraction, showed a low grade but persistent iridocyclitis which resisted all treatment until a urinary analysis demonstrated sugar, when the condition yielded to proper dietetic treatment.

CONGENITAL CATARACTS WITH CALCAREOUS DEPOSITS.

S. MITCHELL, M. D.,

HORSELL, N. Y.

That calcareous deposits are not met with more frequently in congenital cataracts is doubtless due to the fact that the formation of these deposits is an advanced stage in the degeneration of the crystalline lens and reach their full development towards adult life. Hence we would expect to find the most pronounced specimens of these deposits in cases of monolateral congenital cataracts. There being useful vision in one eye, these cases do not come under the care of the ophthalmic surgeon for operation until the age of young manhood or young womanhood is reached, when cosmetic operations are most in demand.

The paper by E. Treacher Collins on "Developmental Deformities of the Crystalline Lens," read in the section of ophthalmology of the American Medical Association at Chicago last June, called my attention to a case recently under my care, similar to one that he therein reports. This led me to address a letter to Mr. Collins, giving a short history of my case. A reply to my letter was received from this renowned ophthalmologist a few days ago, and at the suggestion of the editorial secretary of THE OPHTHALMIC RECORD the correspondence is given herewith: E. Treacher Collins,

London, England.

Dear Sir:

In your very instructive paper on "Developmental Deformities of the Crystalline Lens," read in the section of Ophthalmology of the American Medical Association at Chicago last June, you refer to a form of congenital cataract in a child of 18 months, whom you operated on in January, 1906, and "succeeded in each eye in tearing away the central dense white plaque which appeared to have calcareous matter in it. In each eye it has fallen into the lower part of the anterior chamber and remained there since."

The similarity of this case to an eye operated on by myself in November, 1907, is my reason for writing you. The case was that of a young man, 25 years of age, with a congenital cataract in the right eye. The center of the lens was densely white with a very narrow transparent border.

Two needlings were performed, three months intervening between the first and second operations. A distinctly gritty feel-

ing was imparted to the needle when it encountered the dense white center at the time of the last operation. A few days later the white plaque had fallen into the lower part of the anterior chamber and was subsequently removed, by means of forceps introduced through an opening in the cornea. It was wholly a calcareous formation 3 mm. in diameter, and about as thick as ordinary writing paper.

In my very limited experience I have met with two or three cases of congenital cataract where the posterior capsule was of a fibrous nature, but the case mentioned herewith is the only one met with where there was a calcareous formation in the lens.

Yours sincerely,

S. MITCHELL.

S. Mitchell.

Hornell, N. Y.

Dear Sir:

I thank you very much for your letter of September 25th, and for telling me about your case of congenital cataracts with a central calcareous mass which fell into the lower part of the anterior chamber.

These disc shaped cataracts are not, I think, common, and I am very pleased to have my experiences concerning them confirmed by your case.

The amount of calcareous matter deposited in the central white plaque increases with age. Twenty-five was rather late in life for your man to have his congenital cataract dealt with, and would expect therefore that there would be a large amount of calcareous matter.

With kind regards,

Yours truly,

E. TREACHER COLLINS.

17 Queen Ann Street, Cavendish Square, London.

Reports of Societies

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

An ordinary meeting of the society was held on Thursday, October 15, 1908. Mr. Marcus Gunn, President, in the chair.

Dr. Maitland Ramsay showed a spectroscopic test of color vision; Mr. Sydney Stephenson a case of unilateral ptosis treated by the Mota's operation very slightly modified; Dr. A. Ogilvy showed microscopic sections from a case of tuberculous irido-cyclitis in a man aet. 15; Mr. Lawford exhibited a case of bilateral traumatic choroiditis; Mr. Hudson showed a case in which there was oil in the anterior chamber, and Mr. Wray one of follicular conjunctivitis.

Messrs. Frank G. Thomas and J. Herbert Parsons read a paper on a case of dipterous larva in the anterior chamber. The case was that of a male, age 23½ years, a native of Pembrokeshire, who was seen on March 18th this year. Three and a half weeks previous the left eye was noticed to be red and photophobic, and the child seemed occasionally to be in pain. There was no history of injury or illness, nor any symptoms suggestive of intestinal "worms." On examination under an anesthetic the eye showed slight ciliary injection, cornea clear, anterior chamber deepened, and the aqueous faintly turbid. The iris was discolored and pattern fogged. The pupil was irregular, and filled with pigmented lymph. Lying on the iris was a long cylindrical body resembling a small worm, its head in the lower and outer quadrant and tail in the angle of the anterior chamber at the upper and inner quadrant. The body consisted of eight segments, and measured 12 or 13 mm., was of grayish-yellow color, and showed no movements. With a binocular loupe a fine covering of gray material could be made out enveloping it and reflected on to the iris. The tension was 1, and the eye blind. Enucleation was performed the same day. The eye was hardened in formol and sections were made at right angles to the foreign body. The anterior chamber contained exudate in front of the iris, tying down the cylindrical mass to it; the lens was somewhat shrunken, and the vitreous was also shrunken and contained a coagulum. The retina was detached with sub-retinal coagulum. Microscopically the cornea was found slightly infiltrated at the periphery. The anterior chamber was deep, and contained homogeneous coagulum, with multitudes of leucocytes. The angles were widely open, and the region of canal of Schlemm was densely packed with leucocytes. Lying on the

surface of the iris was a circular body bounded by hyaline membrane, which was clearly an animal parasite. The iris, ciliary body, and retina were densely infiltrated with leucocytes. The lens was distorted, showing cataractous changes, and covered by a fibrinous coagulum, the latter being also seen covering the ciliary body. The choroid was *in situ* and practically normal. One section showed the head very beautifully, and this, with others, was submitted to Mr. A. E. Shipley, F. R. S., who thought the parasite was the larva of either the blow-fly or of *sarcophaga carnaria*, or *S. magnifica*. The ova of the blow-fly, or the larvae of sarcophagidae were sometimes deposited in the nasal passages and other channels leading outward in man, and also on the conjunctiva in purulent cases. It was suggested the larva might work its way from the conjunctival sac directly through the thin sclerotic of a child into the interior of the eye, or if deposited in the nostril, might find its way by the nasal duct to the lachrymal artery and thence into the eye by way of the central retinal artery, or of one of the ciliary arteries. The possibility of this larva being that of *hypoderma boris*, of which there were two reported cases in man, and one in the horse, must not be overlooked, since the larva of this fly was of necessity parasitic in mammalia.

The case was discussed by Mr. Parsons, the President, Major Elliott, Mr. Hewkley, Mr. Ormond, Mr. Coats and Mr. Pooley.

Mr. N. Bishop Harman read a paper entitled "Six Generations of Piebalds." He showed a chart of the pedigree of a family in which there was a striking and continuous inheritance of certain skin and hair markings. Some of the members of the family were shown at the meeting. The features were: A white forelock, a white patch of skin spreading from beneath this lock of white hair down the center of the forehead, and in some cases patches of white skin about the trunk or legs. The white tissues were appreciably more delicate than the normal skin and hair. The color of the ordinary hair ranged from a light brown to a deep brown, almost black. There were no other abnormalities. The connections of this family had been ascertained for six generations. Of these four were living. The generations comprised thirty-four childships and 138 individuals. Of the childships, nine showed the inheritance in direct descent. Mr. Harman considered the anomaly to be in the nature of a partial albinism. He discussed the nature of this family history in relation to the inheritance of disease by one or other sex, and to the law of inheritance as propounded by Mendel.

MEETING OF THE MEDICAL SOCIETY OF PENNSYLVANIA, SECTION ON OPHTHALMOLOGY, AT CAMBRIDGE SPRINGS, PA., SEPT. 15-17, 1908.

Analytical Description of the Eye as an End Organ.

Dr. Joseph Willetts, Pittsburg, presented a study of the eye, not as affected by disease, but as a possible factor in disease, through the constant multiple photography of irrelevant impressions to already exhausted centers, as in psychasthenia. He dilated upon the distinction between volition and energy, and their absolute dissociation. He referred to primary nerve-impulses received by the eye and consumed in its dictation to body muscle-movements through projection; also on some fixed fallacies pertaining to the retina. He advocated a mydriatic refraction of such cases.

DISCUSSION.

Dr. David N. Dennis, of Erie: The main features of Dr. Willetts' paper, all ophthalmic surgeons know very well, especially the powerful effect of suggestion. If you let a nervous person get a suggestion that he has trouble with his stomach or liver you, of course, make that person very uncomfortable.

The one thing that I wish to speak of particularly is the necessity of using a mydriatic in refractive cases. I think that too often the patient is looked upon as a mechanical affair that one has to put a lens on, as one would on a microscope. If this were the case, I do not doubt that a glass could be fitted by the average optician without the use of a mydriatic; but even then, it is a question whether the majority of these cases do not subsequently come into the hands of the ophthalmologist. The fitting of the glass is only a part of the correction of the trouble, for there is the eye strain also to be treated. The eye strain is usually greatly increased, and the giving of the mydriatic is as much a necessity as the glass, or even more so; because, if you instill a mydriatic and keep the patient's eye quiet for a time, the trouble will often pass away—at least for a time.

I have one case in mind, a very interesting one that I had occasion to refract some years before the gentleman came down with a severe attack of typhoid. After this attack he had a great deal of eye strain, headache, trouble with his digestion, etc. His physician referred him to me for an examination. He was put under a mydriatic and kept under it for some time. A peculiar feature of the case was that the astigmatism had increased nearly one-third. Full correction was given. As this gentleman regained

his usual strength and vigor the eye went back to its original refraction. He had complete relief in both instances. Just when he was recovering from his typhoid, the refraction was greater than the original. The glasses I then prescribed gave him complete relief. After he had regained his strength, following the typhoid attack, another refraction was made, and his eye was found to be in the same condition as at the original examination. This shows that muscular tension had a good deal to do with this case. I do not think that this gentleman would have received much benefit without the use of the mydriatic.

Dr. Wendell Reber, Philadelphia: There is one point in connection with this paper that deserves particular emphasis. We are inclined to look upon the eye simply as *related* to the nervous system. This a faulty conception, in that it does not go far enough. *The eye is a part of the nervous system*; it is simply the optic nerve spread out so that its possessor may come so much the more readily into contact with his environment. If we could convince the legislature that the eye is actually a part of the nervous system very likely we should get legislation looking to the correction of abuses that exist among refracting opticians today. We must impress this fact upon our medical brethren, so that they may be brought to appreciate that the putting on of a pair of glasses in a suitable case is as much a prescription as any neurological prescription ever given.

Dr. Willets, closing: I tried to bring out a point, but did not succeed in doing so in the way I wanted to. In neurotic cases there is a necessity for something else than merely fitting glasses. We have a tendency to refract them and let them go, but the best way to cure a progressive myopia is a week's rest in a dark room. I tried this in a case that had been given up, and it cured the patient. He was an artist, and had been told to give up painting or he would go blind.

The oculist is placed in an unhappy position in some cases, because the patient conceals incipient psychasthenia. It is only when they can no longer conceal this, that patients go to a physician. The neurologist stated that this artist did conceal his condition.

Regarding treatment in a dark room, it is thought that the pigment epithelium which secretes the visual purple is intended to protect the rods, especially to neutralize the varying intensities of light upon the sensitive elements of the retina. As the visual purple is never found on the cones, and as the cones are the only elements found at the macula, distinct vision, both for objects and

for colors, is independent of its existence. It is a notable fact that the secretion of visual purple is increased in the dark or when the eyes are closed; and it is a known fact that in psychasthenia all the senses are exaggerated or hyperæsthetic, especially the sense of sight. In a condition of this kind a normal production of visual purple is insufficient to meet the requirements; and the ganglionic layer of the retina is, in a measure, unprotected. Complete isolation in an absolutely dark room will relieve the special senses from this excess drain.

Epithelioma of the Lower Lid, with Successful Transplantation from the Arm.

By Dr. George B. Jobson, Jr., of Franklin. Dr. Jobson gave a history of his case, which was briefly as follows: The patient, aged sixty-six, had an epitheliomatous ulcer, the size of a pea, on the margin of the lower right lid. It had been curetted and cauterized twice, with no improvement. He was treated with the electric cautery, with the same result. The ulcer was excised and the wound closed by a plastic operation, performed by a famous Chicago oculist. The wound apparently healed, but the ulcer returned in a month. Dr. Jobson removed the entire lower lid and grafted a piece of the arm. The result has been perfect up to the present time.

DISCUSSION.

Dr. Edward Stieren, of Pittsburg: Dr. Jobson's subject is of absorbing interest to us all, owing to the fact that plastic operations about the eye must be performed quite frequently; and it becomes even more interesting, when done for the eradication of disease. Whether a pedicle-transplantation be done or a skin-graft, is a matter that must be decided by the individual characteristics of the case; but I believe, on the whole, that we usually get better results from skin-grafting. The transplantation of a flap with a pedicle gives us a poorer cosmetic result, with an additional scar, and more puffing or fullness of the flap. However, the transplantation of a flap from another part of the body also has objections, in that the line of union is usually well defined, and that the graft has a different color from that of the surrounding skin. The success of this procedure is due to gentle handling of the flap, the avoidance of chemical irritants, and strict asepsis. The flap should be one-third or one-half larger than the area to be covered, and should be one-third or one-half longer. Grafts usually grow well about the face, but about the inner corner of the upper lid, movement of the lid sometimes

prevents prompt union of the transplanted flap. This can be overcome by stitching down the upper lid or exerting traction upon it in some manner.

Dr. Johnson is to be congratulated upon his results in this case: as shown by the photographs, the result would have been perfect had he secured a ciliary border. He is also to be congratulated upon the fact that in spite of using vaseline about the flap, it grew. In my experience, when union by first intention is expected, the use of vaseline defeats the object. A dry dressing usually gives the best results.

Dr. William Campbell Posey, of Philadelphia: We should not forget that many cases of epithelioma of the lid can be cured by other than operative measures. The X-rays and radium have been successful in many instances; and I should like to call attention once more to the favorable results that are often obtained by the use of potassium chlorate, the powder being rubbed into the ulcer every day or two until the healing is assured. This has long been a method of treatment at the Wills Eye Hospital, and my colleague, Dr. Zentmayer, has but recently reported an excellent cure by this means. When it comes to operation I prefer, when the neighboring skin is in good condition, to use the pedicle-flap operation, rather than to replace the denuded area with a flap from elsewhere upon the body. The reader of the paper is to be congratulated upon the practice of most excellent surgery in the restoration of the lid in the case under discussion. He states that it is true that he did not obtain a perfectly normal lid-border; but he need not feel badly about that, for it is surprising how rapidly the lid obtained by a pedicle-flap operation adapts itself to the proper function of the lid, owing to the rapid covering of the raw surface with epithelium. It is interesting to note that the operation was performed under a local anesthetic. I believe that we should try to do more of these operations under local anesthesia. In Vienna, they are using a one per cent solution of cocaine and a few drops of a 1:1000 solution of adrenalin for this purpose; but, as the use of cocaine is very often followed by general symptoms, novocaine is better suited to injection when deep anesthesia is desired, though it is less useful when superficial anesthesia is wanted. A useful procedure was shown me in Buda-Pesth this summer, upon a case in which a tumor had been removed from the lower lid, leaving the usual denuded triangular area. A Dieffenbach operation was performed, and the upper flap was then shortened, and nicely coapted to the parts adjoining, by excising a triangle from it with the base

ing. This simple device gave a most excellent result in the one case I saw operated upon. It is most essential that even in pedicle-flap operations we should try to do the operation as rapidly as possible, and to avoid unnecessary handling or wounding of the flap. Dr. Johnson has dwelt upon this point in considering the transplantation operation. In the pedicle-flap operation we need not control all hemorrhage before the flap is brought into place. A little hot bichloride solution of not too great strength, the pinching of the smaller blood vessels, and the tying of the larger ones will suffice. As few sutures as possible should be used. I prefer an oleaginous dressing, and cover the parts with bichloride vaseline in the strength of 1:3000, after the formula of Dr. Joseph A. White of Richmond. The dressing is not removed for forty-eight hours. A firm compress bandage is necessary to bring the flaps into coaptation with the sub-lying tissues and to control oozing. I have never seen any but the happiest results follow the use of the bichloride salve in plastic surgery, as it is perfectly non-irritating.

Dr. E. B. Heckel, of Pittsburg: I wish to speak in reference to a remark made by Dr. Posey concerning hemorrhage. In epithelial grafting or Thiersch grafting, I have found that the hemorrhage must be absolutely controlled. When a thing is done in a hurry it is not always well done. I have never hurried the operation. I use hot compresses and tie bleeding vessels. I have the surface absolutely clean and glazed before applying the flaps. I do not use sutures, but employ a piece of rubber dam, which is not removed for forty-eight hours, unless there is considerable odor, in which case I take it off after twenty-four hours. The superficial epithelium will always come off. In a negro, the flaps are said to become white. In regard to the use of oleaginous dressings, I do not use oil on the first dressing, but I employ bichloride and vaseline, according to the formula of Dr. White of Richmond, or sterilized cod cream in subsequent dressings. This prevents oozing and the tendency of the skin to wrinkle, as it were, and facilitates the formation of a much better flap. In an operation on the upper lid, it is necessary to anchor the lid down and put it on the stretch so as to increase the area of the raw surface. I recently operated in this way on a negro, anchoring the lid down to the cheek with a suture, holding it down well over the cheek-bone. There was some contraction, and I may have to supplement the operation. The flap should be two or three times as large as the area to be covered, and not merely one-third or one-half again as large.

Dr. Johnson, closing: The objection to pedicle-flaps has been

the shrinking, but a modification of the Denonviller operation has been described by Bediner, in which a small portion of the skin with the cartilage attached is taken from the back of the ear. The piece of cartilage which remains on the skin is connected to the pedicle graft. He then swings it over and puts it into the bed made by the removal of the diseased tissue. It strikes me as a pretty good idea, because it prevents to a certain extent the shrinkage. He anchors the lower lid down, so that the cartilage will not irritate the eyeball until healing. I failed to mention that a graft obtained from the arm has the advantage of being free from hairs, which in the pedicle-graft continue to grow from the skin and cause cloudiness of the lower part of the cornea. If it is deemed best to use a pedicle flap, to reconstruct a lower lid, shrinking may be avoided by using Bediner's modification of Dieffenbach's method, as described in Mueller's *Ophthalmic Surgery*. It is done by freeing the skin flap, as usual, and taking a flap, including a piece of skin and cartilage shaped like a half circle, from the posterior surface of the ear. This is sutured with its raw surface to the raw surface of the skin flap, so that the skin surface of the ear graft comes in contact with the eyeball. To prevent mechanical injury to the cornea by the flap, which is stiff at first, the upper lid is drawn downward by two stitches passed through the margin of the flap, so that the new lower lid lies, at first, against the upper lid.

Gonorrheal Ocular Metastases.

By Dr. Edward Stieren, of Pittsburg. Dr. Stieren stated that occurrence of this condition is now generally accepted, and reported three cases of metastatic gonorrheal conjunctivitis, and one case of arthritis occurring during ophthalmia neonatorum.

DISCUSSION.

Dr. Wendell Reber, of Philadelphia: Dr. Stieren very kindly asked me last evening to open the discussion on his paper. I feel a little hesitancy in doing so, as I have seen no case in my own work. I have, however, seen two cases in the practice of my confreres, one having been an instance of true gonorrheal iritis, proliferating in character. No other factor could be made out, although the case was thoroughly studied. All the exudative symptoms seen in the proliferating form of iritis were present. Eventually the eye was saved by iridectomy.

Another case was seen some years ago with Dr. Hansell of Philadelphia, during an epidemic in Blockley, presented an arthritic

complication. When the primary infection is in the urethra, the ocular manifestations are either truly metastatic or toxic—a word that we are fond of using for all manner of things. However, I do not think that there is any doubt that the toxins associated with gonorrheal conditions show themselves in the blood and in the ocular tissues. Even though there be a low-grade conjunctivitis that shows no special microörganism in the secretion, a careful search in the conjunctiva will at times reveal the microörganism in that situation. Dr. Posey, two years ago, directed attention to this mode of differential diagnosis.

Dr. William Campbell Posey, of Philadelphia: At the beginning of the last century, metastatic inflammation of the eyes of gonorrheal origin was well recognized, and authors referred to it frequently; but, as the years went by, clinicians began to doubt that there was such a thing, until Fournier, in 1866, and Haltonhoff, twenty years later, wrote valuable monographs showing that not only might iritis and other intraocular inflammations be due to gonorrhea, but that conjunctivitis might be produced by gonorrhea in other ways than by direct infection. Ophthalmologists were first convinced of the truth of this by bacterial examinations of cases, of which quite a large number have been made in the past thirty-five years. A paper written by me about three years ago was the first reference to the subject in English for a number of years. Metastatic inflammation may be occasioned either by the gonococci themselves, circulating in the blood and forming emboli in the minute blood-vessels of the eye; or through the medium of a gonotoxin, which has been described by various authors, but of which but little is known. It has been shown microscopically that the gonococci do lodge themselves in the deep submucous tissues of the conjunctiva, and that they may set up either a mild grade of inflammation in the conjunctiva or an active grade, which may resemble purulent conjunctivitis. In a case that I reported three years ago, the patient developed a gonorrheal rhinitis, and the inflammation spread from the nose to the conjunctiva through the tear-ducts. The inflammation affected the conjunctiva of both eyes, and ran a rather subacute course. A relapse followed after several weeks, when the conjunctivitis was complicated by bilateral, interstitial, punctate keratitis. This yielded slowly to treatment, and, one month later, a gonorrheal iritis developed in both eyes. This ran a protracted course. The patient was the subject of pronounced gonorrheal rheumatism; but, for a year or more, he has been in excellent health. A case of arthritis, probably occa-

sioned by purulent inflammation of the conjunctiva, occurred in my service at the Children's Hospital. A study of the blood was made, and no gonococci were found; but Dr. J. P. Crozer Griffith thought that, as there was no other evidence, the arthritis might have been set up by the ocular inflammation.

I have used the treatment with gonorrheal serum in a number of instances, but have never felt that I had gained any positive result from its use. I had the opportunity of studying a colored man with severe iridocyclitis, in whom gonococci were in the blood all last winter; but despite all local and general treatment, including the use of the serum, blindness ensued.

Dr. L. Leo Doane, of Butler: My experience in this line of work has been limited, and I have but one case to report. It occurred in a young man of about eighteen. I was called some distance into the country to see him. The joints, particularly the knee-joints, were much affected with the gonorrheal poison; but one eye was affected, the left, which had a marked iritis, and also a diffuse keratitis. A great deal of photophobia and considerable pain were present. The iris border was swollen, and there was much discoloration. Under a mydriatic, about one-fourth of the iris border was found attached to the lens. This, however, yielded to the treatment, which consisted of atropin and hot applications, mainly. The attachment seemed to yield completely, and the pain gradually subsided, but it started it up again a little while afterward, and seemed to increase under the hot applications. The patient himself attributed the increased pain to the hot cloths that were applied, so I had them changed to ice cold applications, with the happiest results. A few days subsequently I called and found him free from pain. The pupil was round and a little dilated, and the pain had almost entirely ceased. That was the last time I saw the case, which I think went on to complete recovery.

Dr. Clarence M. Harris, of Johnstown: I had a case in a man thirty-five years of age, who had had acute gonorrhea two years before and intermittent gleet afterward. Shortly prior to seeing me he had had arthritis in the small joints of both feet. The iris was found to be bound down generally, and the pupil filled with exudate. He had slight pain and very little redness. It was not improved by any treatment that was applied. Atropin caused irregular enlargement of the pupil at a few points. The general treatment of the arthritis also failed to do much good. I have not seen the man recently.

Dr. Stieren, closing the discussion: I think that the value of

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the whole subject lies in calling attention to the possibility of gonorrheal infection by metastases, when there is apparently no other cause for ocular inflammations. In speaking last night to Dr. Reber I mentioned the case of a man whom I saw about a year ago, with negative fundi, and whom I saw again a few days ago with an optic neuritis of one eye only. I was able to eliminate all other causes to account for the condition, but the young man confessed to a gonorrhea of three months' standing. Of course there is nothing positive about it, but metastatic gonorrhea should always be borne in mind in cases of obscure origin. In unilateral cases, it may be due to some focal absorption from the accessory sinuses. This was not gone into in the case of the young man, who exhibited no symptoms to lead me to suspect it. Regarding the mode of metastatic infection, whether it be with gonococcus or with its toxins, this need not interest us, except from a scientific standpoint. It is quite reasonable to suppose that the gonococci can find their way into the deep tissues of the eye, since they are not infrequently found in the joints and in the endocardium. Dr. Doane has just reported a case of gonorrhea followed by iritis of one eye. We find frequent mention of cases in which but one eye is affected in the deeper inflammations, but almost invariably the conjunctivitis is bilateral. The significance of this is not plain.

An Ophthalmological Phase of the Dangers of Consanguineous Marriages.

By Drs. William Campbell Posey and Albert C. Sautter, of Philadelphia. Read by Dr. Posey. The paper contained positive ophthalmological evidence of the dangers of consanguineous marriages. Deaf-mutism, insanity, idiocy, epilepsy, and retinitis pigmentosa, generally attributed to consanguinity, are strongly hereditary. Danger does not cease with the creation of these diseases. Marriages between relations and to the subjects of retinitis pigmentosa should be prohibited. It is desirable that the profession should be of one mind in the position that it assumes in regard to the matter of consanguineous marriages.

DISCUSSION.

Dr. Charles K. Mills: Any remarks concerning this paper will amount chiefly to an assertion of one of two positions. My own position is not exactly that of Dr. Posey, as I understand it. Personally, I can do no other good, I can present some ideas a little, or do not altogether, antagonistic to it.

Consanguineous marriages, in some circumstances, may be pro-

ductive not only of eye affections, of which I have not much knowledge, but also of some forms of insanity, idiocy and imbecility. My own experience, however, is in favor of the old view that the tendency to disease and defect depends upon an imperfect strain in the forebears of those who marry. You all know the old biological evidence brought forth by Charles Darwin regarding an island in the Pacific on which some persons were shipwrecked. They intermarried for generations, producing descendants perfectly sound physically and, so far as they could be studied, mentally. We also know facts regarding aboriginal tribes whose real troubles began, not when they married or had sexual intercourse more or less promiscuously with those connected with them by blood, but when syphilis and alcohol were introduced by more civilized people.

I think, on the whole, that it is best that cousins should not marry each other, though they may do so without any definitely bad result; but often the defect, of whatever sort, present in a single forebear, on one side or the other, is not known. This is often concealed when the effort to bring about a marriage is made; so the general proposition of Dr. Posey is correct. We should be thoughtful about advocating laws absolutely forbidding marriages between persons connected by blood. If such a law is passed, it should be restricted to first cousins.

Regarding idiocy, it is curious that in some large institutions the statistics show that rather few of those suffering from idiocy have been the children of marriages of consanguinity.

It is difficult to say anything of value in a discussion of this sort. I usually advise against marriages of consanguinity, because of the likelihood of some hereditary or family disease in the forebears of one of the parties. I always advise against such marriages when I know that such disease exists.

Dr. Wendell Reber, of Philadelphia. It is with extreme hesitancy that I take a position somewhat antagonistic to that of the last speaker. I feel that men who are engaged in ophthalmological work are more likely to come face to face with this problem than are others, excepting, perhaps, alienists. Therefore, I must bow very low to Dr. Mills' dictum. It was my good fortune in the early part of my career to reside for a year at Norristown, Pa., as a resident at the State Hospital for the Insane, and if one thing stood out more clearly than any other it was the impossibility of getting a family history of insanity. I often strove hard to get members of the patients' families into conversation and lead them to drop some tell-tale incidental remarks; but to try to extract a

family history in such a case is futile. People will cover up such things. Anything in the nature of a blot on the escutcheon is buried away, so that they may forget it, and when two persons conceive a regard for each other they think out the best points in the family history before marriage, and remember the bad ones afterward.

I believe that laws would accomplish nothing. Custom is stronger than law in this country. Law is stronger than custom in England; the unwritten law is the stronger here. If we have it understood among medical men that consanguineous marriages are bad on principle, we shall come to a better realization of what Dr. Posey is striving for. There is a generally accepted belief in the ophthalmic profession that this is met with most frequently in the Hebrew race, who intermarry a great deal.

There is one final thought: Those who are familiar with L. Johnson's study of the mammalian eye will know that a condition resembling retinitis pigmentosa exists in the lower animals, and it is questionable whether this is not a reversion to the lower type.

Dr. M. V. Ball, of Warren: It seems to me that the same reason that would prevent marriages between cousins would prevent marriages among their descendants. There would be the same doubling in the offspring. We all remember, years ago, how many advocated the prohibition of marriages among members of tubercular families. Since then, we have changed our views as to the inheritability of tuberculosis. Many of the diseases that we have looked upon as inherited or inheritable require a great deal more study than has yet been made, in order to determine whether this view is correct or not. Our statistics are very crude. We have not followed the subject carefully enough and have not studied the figures by groups of nations or of families. In some nations marriage between cousins is more common than in others. Are such diseases more frequent in these than in the others. For years we have had close intermarriage in royal families, and scrofula and other diseases have been considered very common among these. Because of this intermarriage we have no real statistics regarding the matter, however. Dr. Posey has mentioned that Queen Victoria and her descendants have intermarried, and yet neither her family has been respectably healthy, as a rule.

So in regard to retinitis pigmentosa, Dr. Reber has stated that it is more prominent in the Hebrew race than in others. In a section of the state there are very few of this race, yet only in the few weeks I have seen in Americans three or four cases of retinitis pigmentosa in which I could trace no inheritance.

Regarding the evil results of consanguinity, there are nations in which this is common; and if we could have statistics on the subject from them, we might be able to draw some conclusions. The same might be said concerning idiocy and many other diseases. Many of the figures may be used to support the contrary argument, namely, that there is less idiocy among the consanguineous than in other cases. Some disease is present in every family. Taking a large group of persons, we are bound to find some disease in more than one person of that group. We call this inheritance. Outside this group the ratio might be the same; yet we should not call it inheritance. This question of inheritance must be looked into scientifically before we can reach a decision.

Dr. Edward Stieren, of Pittsburg: I should like to ask Dr. Posey to state whether there is at present a law in Pennsylvania forbidding the marriage of first cousins?

Dr. William Campbell Posey, closing: The chief purpose of our paper was that general practitioners might realize that there is such a thing as retinitis pigmentosa, and that at least twenty-five per cent of the cases of this disease are due to the marriage of cousins. It is probable that a much higher number are due to this cause, for it is necessary to go back three or four generations before one can say that the disease has not been originated by consanguinity, and this is usually impossible. People do not know their family history, even in excellent families; and it is rare that members are familiar with the history of more than one generation. In view of the statistics brought out by the paper, it seems to me that we are justified in saying that first cousins should not marry; and it is necessary that the profession should be of one mind in the advice that it gives. A man who is very much in love with his first cousin goes to an oculist and says: "I hear that there may be trouble with the eyes in the children of consanguineous marriages. Ought I to marry my first cousin?" The oculist, perhaps, may counsel against it; but not liking to take all the responsibility of forbidding such a marriage, advises the man to consult a neurologist. The latter, perhaps, may give different counsel; and may, for example, cite the case of the late Queen of England and her consort, claiming that all their children were healthy. The man, in doubt, from the advice that he has received, goes away, and is compelled to make up his mind for himself. This should not be. The profession alone are capable of forming a proper opinion upon the subject, and it is extremely desirable that they should be unanimous in this matter.

All other considerations aside, it seems to me that the risk from such marriages to the eyes alone is too great to be incurred; and I believe that not only should legislation prevent the marriage of such cousins, but also that medical men should be unanimous in advising against it. It is very desirable, also, that students should be instructed regarding the consequences of such marriages. A recent search through the text-books of medicine and neurology has convinced me that the average medical student has had no instruction upon the topic. Surely, somewhere in their text-books they should find a clear exposition of the subject.

Dr. Heckel: Fortunately the responsibility has been taken off Dr. Posey's shoulders, as the legislature, four years ago, passed such a law.

Trachoma and the Public Weal.

By Dr. Clarence P. Franklin, of Philadelphia. Read by Lewis H. Taylor, of Wilkes-Barre. Dr. Franklin stated that trachoma is a disease with no present cure, the result being invariable damage to the eye. It is generally unrecognized in medical clinics. Usually found in foreign-born patients, trachoma is of vast importance in its relation to health and the ability to earn a livelihood. In view of the vigorous exclusion of these cases from the United States at quarantine, it is the duty of the medical men to aid in the detection of this disease within our borders.

DISCUSSION.

Dr. William Campbell Posey, of Philadelphia: Undoubtedly our government is doing everything it can to keep cases of trachoma out of the country, and has succeeded so well that the English government has taken action whereby persons from the continent with granulated conjunctivitis who had intended to go to the United States and have been turned back by our government should not be admitted into England. The steamship companies know that if they bring such passengers to our shores they will have to take them back again at their own expense, so that they now examine all emigrants at their own port, and allow none to go on board ship that have trachoma. We have trachoma here, however, among the aliens; and we are not doing all we can to treat the disease properly or to eradicate it from our commonwealth. I agree it that Dr. Franklin wishes to have some means adopted by the state of Pennsylvania whereby this may be done.

It is very of interest to know how the London Board of Health combats the disease in that city. If a child in one of the

pauper schools gets a sore eye is sent at once to Mr. Treacoe, Collins or Mr. Sidney Stephenson, the oculist of the board. If the disease is found to be trachoma, the child is sent at once to one of four isolation hospitals in the suburbs of London. I had the pleasure of visiting the hospital at Swanley with Mr. Collins last year. It holds two or three hundred patients, and is built on the cottage plan, each cottage accommodating about thirty children and being presided over by a cottage mother, who vies to keep the children in her house neater and cleaner than those in the other cottages. There is also a resident medical house officer. The patients are treated, not only medically, but also educationally, the latter having been found necessary, as it is often desirable to keep the children under surveillance for a year or more until the disease is eradicated; and if a case of granular conjunctivitis is treated early it can be cured. One can see dozens of these patients, with almost normal mucous membranes, being trained to be wage earners instead of a public menace. Many of the boys become soldiers and sailors. What an excellent thing it would be if we could change the seven per cent of blind in our own blind asylums into wage earners!

I believe that we should have a trachoma hospital in all our large cities, and also in the mining regions and other portions of Pennsylvania where there are so many cases of the disease. I believe, therefore, that the appointment of a committee to look into the matter is most desirable. The patients in the London hospitals are not allowed to leave the grounds of the institution until they are thoroughly well, usually at the end of one or two years.

Dr. Lewis H. Taylor, of Wilkes-Barre: I also think that it would be well to have such a committee appointed, but this plan is not exactly new. A number of years ago, before we had the Section on Specialties, the State Society took the matter up, and a committee was appointed to investigate the condition in the Soldiers' Orphans' Schools and other institutions. Certain rules were formulated and distributed throughout the state in reference to this disease. The present State Department of Health has placed trachoma on the list of contagious diseases; and it is as much necessary for us to report a case of trachoma as to report one of smallpox. It is true, however, that many physicians do not diagnose the cases and many others do not report them. Every practitioner is not able to diagnose a case of trachoma, and it is equally true that many are not able to diagnose a case of smallpox.

Dr. Heckel: I am glad that Dr. Taylor has brought out the

fact that the state has already taken up the subject of registration of trachoma. In Pittsburg we do even more, we have a visiting staff for the public schools, which discover the cases so that they may be treated. We have no means of isolating them, however, but the cases must be reported. I think that the recommendation of Dr. Franklin ought to be modified a little, so as to comply with the existing state regulations. We should request the committee to investigate the existing conditions and report upon the facility of isolation and treatment.

Dr. Wendell Reber, of Philadelphia: It seems to me that the question is whether we shall advocate the establishment of isolation. For three years I practiced in the mining regions, and I saw more trachoma there in three years than I have seen in Philadelphia in twelve years. I am sure that we are now seeing fewer cases of the disease in Philadelphia than I saw fifteen years ago at the Wills Eye Hospital. Isolation, however, appeals to me very much; and I think that this particular point should be pressed home.

Dr. Edward Stieren, of Pittsburg: While it is true that we are required to report cases of trachoma, yet this in itself will not check the spread of the disease. No means is taken to protect others from acquiring it. Last spring I took up with Dr. Edwards, the superintendent of the Board of Health of Pittsburg, the matter of assigning a room at the Municipal Hospital for the segregation of such cases, and have strong hopes that this will be made possible before long.

I think that those afflicted with trachoma should be educated as to its contagiousness until the third stage, when the danger is not so great, has been reached. Much might be accomplished in this way until we are able to segregate the cases. I read a paper on this subject before the Allegheny County Medical Society in June, in which I presented a list of instructions in four languages, to be distributed among the dispensaries and out-patient departments of hospitals. If the patients can be so educated as to take a little care, something will be accomplished. When I wrote this paper, I knew nothing about the plan that is pursued in London, which is, of course, ideal.

Dr. G. R. S. Corson, of Pottsville: As to the resolution, I think that it can come only before the House of Delegates.

Dr. Heber: We can pass the resolution and have it referred to the House of Delegates.

Dr. Wendell Reber, of Philadelphia: I move that the reso-

lution of Dr. Franklin be adopted as modified with the words "the registration" stricken out.

The motion was seconded and carried, and Dr. Reber was appointed to present the resolution to the House of Delegates.

Beginning Signs of Retinal Angiosclerosis.

By Wendell Reber, of Philadelphia: This was discussed in connection with the following paper:

Gross Obstructive Diseases in the Retinal Vessels.

By Dr. Clarence M. Harris, of Johnston.

DISCUSSION.

Dr. E. B. Heckel: This subject is attracting a great deal of attention, because it gives us an opportunity to study the blood vessels during life, where we can actually see them. Their condition in the remainder of the body we can only surmise, but in the eye we can study the changes that have taken place in them. That a spasm is the result of autointoxication, I strongly believe. We frequently see so-called "blind headaches," which begin with a scintillating motion in the peripheral field. Eventually the field narrows down, and produces the phenomenon of looking through a narrow tube. This is followed by the clearing up of the vision and an intense headache. Sometimes the scintillating effect is absent. I have asked patients to come to me during an attack, so that I might observe them at this time; but few happen to live near enough to find it convenient to come to see us then, and we do not have the opportunity of studying them during these attacks. In the few that I have seen, I think there was a perceptible diminution in the caliber of the vessels. There is room for considerable personal equation in reckoning this, and this source of error may be great. Nevertheless, these conditions are relieved by the inhalation of amyl nitrite. I had a patient who had been an intense sufferer. He was afraid to try amyl nitrite, but he recently came to me, and I suggested it again. He said that he would try it. I told him to be careful not to inhale all of the pearl. Instead of that, when he had the next attack he broke the pearl under his nose and held it there for some moments. He fell over, and the druggist became much alarmed and immediately sent for a physician. The patient revived before the physician arrived. He has had no attack since. He thought that the cure was rather decided, but a good deal better than the disease. Whether the headaches will return is a question; but the chances are that they will. I myself am a sufferer from these so-called

"blind headaches." Calomel usually relieves the condition, and I think that it is due to some form of autointoxication.

Dr. Reber, closing: There is no difficulty in making the diagnosis of beginning retinal angiosclerosis, a close study of ordinary cases being alone required. Such patients usually come for refractive purposes, their life habits having been wrong, and they have reached a time of life when this condition of affairs is revealed by urinalysis and by numerous vasomotor signs.

It is a significant fact that of the three great organs that contain end arteries, the eye is the only one that affords an opportunity of studying the circulation at first hand. As to the gross obstructive lesions observations made post mortem on individuals that have suffered thus during life do not frequently support the idea that embolism exists in these cases. Thrombosis, such as we see in this drawing, that I pass around, is the more common picture. This is the soil upon which *there so often develops* a glaucoma, which we usually treat unsuccessfully. The conditions pictured in the first drawing represent the stage of twisted artery,—the early stage, usually overlooked,—in which so much can be done for the patient.

Dr. Harris, closing: The remark that Dr. Reber has made in regard to the early signs of the condition is interesting. I have often observed the tortuosity of the vessels and the peculiar color of the disk. So far as the age of the patient is concerned, I touched upon this point in the first part of my paper. One of my patients was sixteen years old, and one was thirty. The latter was a woman in good health. The other cases were in old people. There is evidently a great deal yet to be investigated and understood in connection with this condition.

I have found the circulation, as a rule, to be sluggish. I have no actual data as to whether the pupil is small.

Dr. Heckel: I have come to think that a small pupil is a sign of general arteriosclerosis.

Acute Contagious Conjunctivitis.

By Dr. Oliver H. Fretz, of Quakertown. Dr. Fretz spoke of the acute epidemic disease popularly known as "pink-eye," asserting that the active causative agent is a small bacillus. The duration of the disease is from ten days to a fortnight, and it is curable only so long as the secretion is present. Relapses occur, and one attack does not insure against subsequent ones.

DISCUSSION.

Dr. Samuel Z. Shope of Harrisburg: I should just like to

ask whether Dr. Fretz meant per cent of grains to the ounce in organic silver nitrate.

Dr. Fretz: One and a half to two per cent.

Dr. Wendell Reber: Acute contagious conjunctivitis is a very violent disease at times. Clinically, you can not make the diagnosis from the appearance of the eye alone. Systematic examination has led us to a lot of information. A large number of cases appeared at a dispensary in Kensington one day. All presented conditions simulating almost any form of conjunctivitis, but suggesting acute contagious conjunctivitis. Smears were made, and all showed gonococci—not many—just a very few. It was a low-grade gonococcal conjunctivitis. All had been using a public bath house in Kensington.

A prominent member of this association has recently gone through a most violent purulent infection of all the upper air tracts, with a violent conjunctivitis. It is impossible to say whether the specific organism was present in the upper air passages in the latter stages. He has been going to a private natatorium all summer long. He tells me that he knows of four or five other cases among men who have been in the habit of going there this summer. He feels that his was a pneumococcus infection.

On the other hand, a case in a child was put down emphatically as gonorrheal conjunctivitis in the new-born proved microscopically to be acute contagious conjunctivitis. The more we go into this thing, the more we learn. I have seen cases presented before a clinic that from the clinical condition were said to be angular conjunctivitis, but which proved to be altogether different under the microscope. The smears are easiest to make, but, of course, cultures are the final test. I have an arrangement with an assistant to look after these things. I think that a further study of what is commonly called acute conjunctivitis will throw interesting light upon this subject.

Dr. L. Leo Doane, of Butler: I should like to ask whether many of these cases are not due wholly or partially to the pneumococcus. I think that many are mixed infections; and when we get a case of this sort we can not say whether it is due to the pneumococcus or some other infection without a microscopic examination.

Dr. Heckel: There is no doubt that the microscope is the final aid in arriving at a diagnosis; but whether smears are always reliable is a question. Some very good pathologists say that they

are worth nothing. The culture is the best means of arriving at a positive diagnosis.

Examination of the nose has been referred to. I think that it is important to look after the condition of the nasal cavity and the neighboring sinuses. I do not believe in splitting of the canaliculus. I do not think that this should be done, except as a last resort, for to carelessly destroy this beautifully constructed tube is bad surgery.

Dr. Reber: Dr. Alt of St. Louis has reported ninety per cent of the cases as due to the pneumococcus.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

At the meeting of the Wills Hospital Ophthalmic Society, held at the Hospital on Monday, October 12, 1908, with Dr. Samuel D. Risley in the chair, the following program was presented:

Dr. Charles A. Oliver exhibited a case which had presented the characteristics of malarial keratitis. The patient, a young woman, came to the hospital in September, 1907, with inflammation in the right eye. She had resided in a malarial district. The blood showed the plasmodium, which disappeared when antiperiodic doses of quinine were administered. The local symptoms were effectually combatted with atropia, boric acid lotions and hot stupes. There was rapid recovery. Later in the winter the left eye became inflamed. In this attack, during Dr. Oliver's absence, the salicylates were ineffectually prescribed. The patient remained in the hospital for one month. The local treatment was the same as in the primary attack. Upon Dr. Oliver's return the condition was immediately relieved by the administration of quinine. No plasmodiums were found in the blood after the quinine had been used for several days. There has been no exacerbation since that attack. In commenting upon malarial keratitis, Dr. Oliver stated that at the time this young woman was going through the second attack he was in the southern portion of the United States and that while there he saw a number of similar cases. In several instances, they had become ulcerous in type, having been ectogenously infected by pyogenic bacteria. Usually the main site of the disease was below the center and somewhat peripheral. The disease in the south displays more marked types than one sees in the north.

Dr. Posey referred to Dr. Oliver's explanation of the shape of the ulcer in dendritiform keratitis, and said that it was interesting to observe the different forms, which opacities of the cornea might assume, owing to the manner in which the lymphatics were affected. He recalled a case of inflammation of the

cornea of cause unknown, where the infiltrate which appeared at the nasal limbus, slowly pushed its way forward into the cornea in concentric circles, until after a time the pupillary border was reached. The infiltration was not homogeneous, but pushed its way forward into the cornea in successive semicircular lines of infiltrate with comparatively clear cornea between the circles, and as the zones of infiltration presented somewhat of a scalloped appearance, finally grew to resemble a minute oyster shell in appearance.

Dr. Risley said that, as far as one could judge from the deep nebulae remaining in the cornea of Dr. Oliver's patient, the type of inflammation must have been more severe than he had usually seen in dentic keratitis which was, in his experience, quite superficial. He thought it probable that the ulceration and deep infiltration of the cornea was the result of secondary infection, to which the cornea was rendered liable by the disturbance of its epithelium by the primary dentic keratitis.

Dr. Oliver said that the dentic types are, as a rule, purely microbic, and give the well known clinical expression of crescentic, serpentic, rodent, etc., infiltration, by reason of the lymph channel formation and the lines and situations of least resistance. Erosion in such cases, with the entrance of pyogenic bacteria, give rise to both superficial and deeply seated suppurative processes. These have nothing to do with a true corneal inflammation of malarial type. It must be remembered also that microbic invasion may occur in malarial subjects and produce mixed types of combined endogenous and ectogenous inflammation.

Dr. Risley reported briefly the history of two patients who had just applied for treatment at his service in the hospital, complaining of sudden blindness in one eye. In Case 1 there was no light reflex from the fundus, but oblique light showed the lens opaque in its posterior cortex and probably an opaque posterior capsule. This could not account for the total blindness of the eye and the complete absence of light reflex. The tension was normal; there had been no pain; the consensual contraction of pupil was normal. Dr. Risley regarded the case as one of abundant hemorrhage into a probably fluid vitreous. This opinion seemed, he thought, to find corroboration in the condition of the fundus of the fellow eye, which was woolly, dark red, and showed a tendency to massing of pigment, and absorption areas.

In Case 2 also the blindness had come on in one eye suddenly, but was not so complete as in Case 1, and a faint reflex could be obtained from the upper temporal side of the fundus. He could

not count fingers, he had no pain, and there was no increase of tension.

In neither case could any cause be assigned by the patient for the sudden occurrence of blindness. Both patients were under forty years of age and, so far as they knew, in good health.

As the cases had just applied for treatment, Dr. Risley deferred any further discussion of their condition until a more extended study could be made, and hoped to report the result, which he would make the text for a discussion of hemorrhage into the vitreous, at a later meeting of the Society.

Dr. Posey referred to the etiology of hemorrhage of the vitreous in young men and quoted earlier observations that many subjects of this condition were sufferers from chronic constipation. This feature was not present in either of the cases under discussion. He spoke of the observation of another English ophthalmologist that many of these cases were addicted to masturbation.

He thought the prognosis much better in this class of cases than one might be led to expect from the serious lowering of vision, and quoted two cases which had occurred in his own practice, where vision was reduced to counting fingers as a consequence of vitreous opacity, in both of whom 5-15 vision or more was obtained in each eye by prolonged treatment with the iodide, mercury and pilocarpine sweats; notwithstanding that the age of one of the cases was over 50 years.

Dr. Oliver said he knew of Mr. Eales' work very well and had studied one of his patients most carefully. The hemorrhages with their after changes in these cases, which are supposed to be hepatic in their etiology, are peripheral. They are ephemeral and are not disturbing to the most important functioning portions of the visual apparatus.

He believed that generally, in cases of hemorrhage, prognosis depends upon the age of the patient, the general vascular condition, and the seat of the hemorrhage. Subhyaloid extravasations or those from peripherally situated vessels, not invading the most important portions of the visual material, offer the best prognoses for return of vision to practically normal; but in many such cases, unfortunately, recurrences are likely, and to be guarded against by appropriate general and local hygiene.

Dr. Burton Chance reported from Dr. Schwenk's service a "Case of Pyramido-Zonular Cataract" (See OPTHALMIC RECORD, Vol. 19).

Regular meetings of the Society are held at the hospital

on Tuesday, November 3, 1908. All students and practitioners interested in Ophthalmology are invited to attend the meetings of the Society and to become members thereof. The dues are one dollar a year.

BURTON CHANCE,

235 So. THIRTEENTH ST.

Secretary.

New Books

The Complications of Diseases of the Frontal Sinuses. By Dr. P. H. Gerber, A. O., Professor and Director of the Royal University Policlinic for nose and throat diseases, in Königsberg i. Pr. Compiled with numerous tables, 36 illustrations and 2 plates. Published by S. Karger, Karlstrasse 15, Berlin, 1909. Price 15 m. (\$3.60). Bound, 16.50 m. (\$3.96).

This book is the result of five years of hard work on Professor Gerber's part and represents an exhaustive search through the literature of the subject. In addition many unpublished cases were acquired by personal letters to many rhinologists the world over. The anatomy, physiology and clinical manifestations are most exhaustively treated and are invaluable to ophthalmologists, as well as rhinologists, especially in view of the recent interest being taken in the relation of nasal to ocular diseases.

A Study of the Pupils—Anatomy, Physiology and Pathology and Methods of Examination. By Dr. Ludwig Bach, Professor of Ophthalmology in the University of Marburg. With 27 illustrations, many of them colored. Published by S. Karger, Karlstrasse 15, Berlin. Price 12 m. (\$2.90).

This is a most complete consideration of the pupils, being a book of 344 pages. Under anatomy are considered the various brainpaths along which the impulses travel to bring about the different pupillary reactions. These reactions are most thoroughly discussed both in health and in disease, such as ocular, orbital and brain diseases. Apparatus and methods of examination of the pupil reflexes are exhaustively treated. References to the literature of the subject are profuse, 1,778 references being given. An index is appended.

Notes and News

(Personals and items of interest should be sent to Dr. Frank Brawley,
72 Madison Street, Chicago)

Dr. S. J. Bumstead of Decatur, Ill., died recently.

Dr. Rigobert Possek has qualified in ophthalmology in Graz.

Dr. Nelson B. Covert, an ophthalmologist of Geneva, N. Y., died November 7th, aged 68 years.

Dr. Otto V. Sicherer, provatdozent in Munich, has been given the title of professor of ophthalmology.

Dr. Frederick H. Wells of Grand Junction, Colo., died of meningitis at St. Joseph's Hospital, Denver, November 5th, aged 47 years.

Wills Eye Hospital of Philadelphia is to be enlarged at a cost of \$30,000. The main building is to have an extension of twenty feet.

Dr. Frederick M. Spalding of Boston has been appointed to the Committee on Ophthalmia Neonatorum of the Massachusetts Medical Society.

J. T. Bradley, a traveling oculist, was recently sent to jail in Danville, Va., for practicing without a license. Upon payment of a \$25.00 fine he was released.

Dr. William T. Shoemaker of Philadelphia has received the Marczenka prize for his work on "Retinitis Pigmentosa." The prize is awarded by the College of Physicians of Philadelphia.

Dr. Emil G. Rehfuess, a well known ophthalmologist of Philadelphia and chief of the eye, ear and nose clinic at the German Hospital in that city, died October 31st at the age of 47 years.

On page 589 of the November issue in article by Dr. H. Gifford entitled "On Sympathetic Ophthalmia After Evisceration and Mules Operation" the reference for Burchardt's case was accidentally omitted. The case was reported in *Charité Annalen* XIX, page 237.

A new out-patient eye-clinic has been established at St. Michael's Hospital, Toronto. Dr. G. Herbert Burnham is in charge, with Drs. Newbold Jones and H. Allan McCullough as assistants.

Dr. L. Webster Fox of Philadelphia acted as chairman of the Committee on Medical Day at the recent celebration of the two hundred and twenty-fifth anniversary of the founding of Philadelphia.

Dr. Wm. S. Keller has opened offices in the Groton Building, at Seventh and Race streets, Cincinnati, Ohio. Dr. Keller will also have office hours in Middleton, Ohio, every Wednesday from 1 to 6 p. m.

Dr. George F. Keiper of La Fayette, Ind., has been re-elected secretary of the Ninth Counsellor District of the Indiana State Medical Association, at the meeting held at Crawfordville November 10th.

Dr. G. C. Savage of Nashville, Tenn., was recently elected president of the Southern Medical Society at the Atlanta meeting. The next meeting place will be New Orleans, on the second Tuesday in November, 1909.

Dr. Alexander W. Stirling of Atlanta, Ga., at the recent annual meeting of the Southern Medical Association, was made chairman of the Section of Ophthalmology, with Dr. Arthur B. Harris of Birmingham, Ala., as secretary.

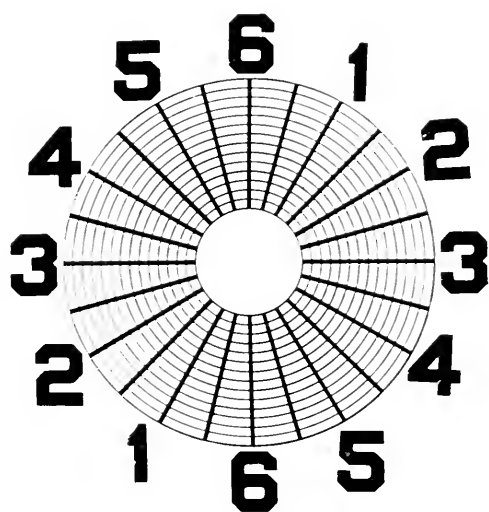
Drs. R. L. Thomson, A. H. Coe, Wilson Johnston and C. A. Veasey, the latter formerly of Philadelphia, have associated themselves for the practice of diseases of the eye, ear, nose and throat in Spokane, Wash. Their offices are located in the Traders Building.

At the November 6th meeting of the Board of Medical Directors of the Cincinnati Hospital, Drs. Robert Sattler and Derrick T. Vail were elected oculists for the coming year. Drs. Christian R. Holmes and Stephen A. Ayres were elected to the consulting staff.

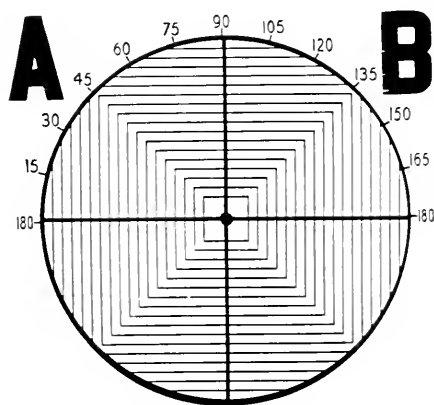
Dr. Thomas Darlington, in a protest against a reduction of the appropriation for the New York Health Department, urged that active measures be taken to control midwives in their treatment of the eyes of new-born babies, as this is one very frequent source of blindness and one easily prevented.

A Doctor's Old World Tour has been arranged by the Redford-Solomon Agency for those physicians who wish to attend the Eleventh International Congress of Ophthalmology at Naples. The party sails from Boston March 13, 1909, and it is desirable owing to the heavy bookings at that season from Boston to the Mediterranean that reservations be made by January 1, 1909. The expense will be \$660 from Boston back to New York. Additional information may be had by writing to Dr. G. C. Savage, 127 Eighth Avenue W., Nashville, Tenn.

The new addition to St. Luke's Hospital, Chicago, known as the Smith Memorial, has been formally opened. The building is now used for pay patients only, all charity work being confined to the older building. The equipment is most complete in every particular and is due to the untiring efforts of Mr. Louis R. Curtis, who has been St. Luke's superintendent for many years. The disadvantage of a hospital located amid the noise and dirt of a city is somewhat overcome in this instance by double windows and forced



No. I.



No. II.

To accompany article by Edward Kieth Ellis in November issue of
The Ophthalmic Record.

ventilation. The ventilating system is particularly good. The air is filtered and then washed by passing it through an artificial rainstorm, and is then sent to each room separately so that the opening of doors and windows in a room affects only that particular room and does not disturb the ventilation of the rest of the building. There is a special eye, ear, nose and throat operating room, artificially lighted with Tungsten lights. A number of additions have been made to the attending staff, the staff for ophthalmology and otology having been increased by the election of Drs. Cassius Wescott and Frank Brawley.

CHICAGO EYE CLINICS.

| Hour. | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. |
|---------|---|---|--|--|---|--|
| 9 A.M. | Richard S. Patillo (P.-G.) J. F. Burkholder (E. E. N. T.) | G. W. Mahoney (Poli.) Geo. F. Suker (P.-G.) (E. E. N. T.) | E. J. Brown (E. E. N. T.) | G. W. Mahoney (Poli.) Richard S. Patillo (P.-G.) J. F. Burkholder (E. E. N. T.) | Richard S. Patillo (P.-G.) Oliver Tydings (E. E. N. T.) | G. W. Mahoney (Poli.) E. J. Brown (E. E. N. T.) |
| 10 A.M. | Richard S. Patillo (P.-G.) J. F. Burkholder (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | E. J. Brown (E. E. N. T.) | L. J. Hughes (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) |
| 11 A.M. | Richard S. Patillo (P.-G.) J. F. Burkholder (E. E. N. T.) | A. G. Wippert (E. E. N. T.) | J. R. Hoffmann (E. E. N. T.) | A. G. Wippert (E. E. N. T.) | H. W. Woodruff (E. E. N. T.) | A. G. Wippert (E. E. N. T.) |
| 1 P.M. | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) | Willis O. Nance (C.C.S.) |
| 2 P.M. | E. V. L. Brown (Inf.) E. J. Gardner (E. E. N. T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) W. A. Fisher (E. E. N. T.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) Frank Allport (St. Luke's) *Frank Brawley (St. Luke's) Thos. Faith (E. E. N. T.) E. K. Findlay (Inf.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | E. V. L. Brown (Inf.) M. H. Lebensohn (Inf.) Willis O. Nance (Inf.) D. C. Orcutt (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) | *Chas. H. Beard (Inf.) W. Allen Barr (Inf.) E. K. Findlay (Inf.) W. A. Fisher (E. E. N. T.) Wm. E. Gamble (Inf.) J. B. Loring (Inf.) N. E. Remmen (Inf.) Emily Selby (Inf.) Wm. H. Wilder (Inf.) H. B. Williams (Inf.) M. H. Lebensohn (P.&S.) S. L. McCreight (C.C.S.) |
| 3 P.M. | W. Allen Barr (C.C.S.) *Wm. E. Gamble (P.&S.) | H. H. Brown (Ills. Med.) | *J. E. Harper (P. & S.) W. Allen Barr (C.C.S.) *Wm. E. Gamble (P. & S.) | | W. Allen Barr (C.C.S.) | Geo. F. Suker (P.-G.) |
| 4 P.M. | W. F. Coleman (P.-G.) | C. W. Hawley (P.-G.) | G. F. Suker (P.-G.) | C. W. Hawley (P.-G.) | W. F. Coleman (P.-G.) Brown Pusy (County) | |

*Special operative eye clinics.

ABBREVIATIONS:

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|---|---|--|--|
| C. C. S.: Chicago Clinical School, 819 W. Harrison Street. | County: Cook County Hospital, W. Harrison and Honore Streets. | Poli.: Chicago Policlinic and Hospi- tal, 174 E. Chicago Avenue. | Rush: Rush Medical College, W. Harrison and Wood Streets. |
| E. E. N. T.: Chicago Eye, Ear, Nose and Throat College, Washington Franklin Streets. Clinics all day. | Ills. Med.: Illinois Medical College, 182 Washington Blvd. | P.-G.: Post-Graduate Medical School of Chicago, 2400 Dearborn Street. | St. Luke's: St. Luke's Hospital, 1416 Indiana Avenue. |
| | Inf.: Illinois Charitable Eye and Ear Infirmary, Peoria and Adams Streets. | N. W. U.: Northwestern University, 2431 Dearborn Street. | |



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